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PREFACE.

AMID the several branches of philosophy which interest the human mind, none can present stronger claims to diligent cultivation than those which relate to the healing art. When we consider the various disorders which afflict the human body, and reflect upon the sufferings they induce, and the desolation they often spread, we cannot fail to be convinced that every thing which tends to their elucidation is highly momentous to mankind. But the subject of pathology is not less comprehensive than important; and those who have made the highest attainments in this department of knowledge—those who by attentive observation and ample experience have acquired the greatest sagacity of discrimination, and who exercise the utmost skill in treatment—discover every day that the nature of disease and the indications of cure are very imperfectly understood.

When the present highly improved state of medical science is contrasted with the ridiculous notions and barbarous practice of former ages, we are at once impressed and delighted with the remarkable contrariety; but we are apt to overlook the circumstances by which the superiority of modern times has been established. The various steps in the progress, however, ought not to be disregarded; for, in difficult researches, we derive encouragement from the recollection, that although the exertions of an individual may not advance philosophy in any perceptible degree, yet, owing to the power of example, and the successive influence of opinion, the most obscure, and apparently unsuccessful inquirer, may prove the first or the connecting link in a series of the most valuable discoveries. This observation has been often verified; and in no sciences more frequently than in those which tend to elucidate or alleviate disease. No objects of intellectual pursuit can afford more real interest to an enlightened mind than the subjects in question; and in no allotment of human labour can individual exertion afford the prospect of greater benefit to mankind than in the medical profession,

The daily observation of diseases which baffle the utmost skill, will present to the feeling mind an adequate inducement to cultivate a spirit of diligent research; and where this benevolent principle is the actuating motive, the individual "need not be anxious," says Mr. Pott, "about an apology for the publication of his ideas."

Without undervaluing other branches of pathological science, it may safely be maintained that none is more interesting in itself, or of greater consequence to the medical practitioner, than morbid anatomy—that study which connects a diligent observance of the symptoms during life with a careful examination of the changes of structure which the different parts of the body undergo. Of late years far more attention has been directed to *post mortem* examinations than formerly, and this circumstance must be viewed as one of the principal means by which medical knowledge has been so essentially advanced. Nevertheless, our acquaintance with the phenomena of disease is still exceedingly limited; and although theory and hypothesis may be more fascinating, yet, on the accumulation and the promulgation of

facts, all sound reasoning and solid improvement in medical science must be founded.

A deep conviction of the importance of the subject induced me to undertake an abridgement of Morgagni's voluminous work *De Sedibus et Causis Morborum, per anatomen Indagatis*; and if, by rendering more accessible the valuable stores contained in this long-celebrated work, and by recording a few of my own dissections, I may be the means of diffusing that knowledge by which disease may be better understood, I shall be amply rewarded for my humble though rather arduous labour as an editor.

Other anatomists preceded Morgagni in this path of research, and the *Sepulchretum Anatomicum*, by Theophilus Bonetus, claims priority of attention. Amidst numerous repetitions, and many vague and useless narrations, this work contains facts of great importance, and affords evidence of indefatigable industry. Many of the facts, also, which are related in *Lieutaud's Historia Anatomico-Medica* are extremely valuable and interesting, but in the detail of symptoms it is exceedingly defective. I might add the celebrated names of Ruysch and Haller, both of whom have very accurately

described many of the disorganizations incident to the human fabrick.

Since the time of Morgagni many excellent publications on the subject of morbid anatomy have appeared, but no writers have been more distinguished than Dr. Baillie in England, and M. Portal in France. The labours of our countryman, Dr. Baillie, have certainly yielded us one of the most valuable productions on this subject. Not only did his situation afford him extraordinary facilities for studying organic lesions, but his distinguished talents well qualified him to improve those opportunities to the greatest advantage; and his *Morbid Anatomy* is not only held in high estimation in this country, but has been translated into other languages abroad. By giving a concise description of degeneracies of structure in the organs detached from each other, without a narration of cases, he has prosecuted the subject in a manner different from that of Morgagni. In Dr. Baillie's method needless repetitions are avoided, and the subject is brought within a smaller compass; while, on the contrary, in Morgagni's plan, though a recurrence of similarities is unavoidable, the maladies of the human frame are

exhibited under all the complications with which the practitioner has perpetually to contend. On many points *generalization* is preferable to the detail of particular cases, but in reference to others it has justly been said, that "cases will probably convey more information "in fewer words than description or narrative, "as they identify the kind of disease which is "meant to be described, and inform, as it "were, by example."* Dr. Baillie has also elucidated the morbid appearances by several fasciculi of plates, which are executed with equal neatness and fidelity.

Morgagni informs us, in the preface to the work of which an abridgement is here attempted, that he was, in a great measure, induced to undertake its publication on account of the want of precision in many parts of the Sepulchretum, but more particularly from its needing a supplement to bring it down to his own time. During a temporary absence from Padua, he fell into the company of a young man of exemplary character and amiable disposition, who delighted in the study of science, especially in

* Abernethy on Tumours, p. 23.

relation to medicine; and in compliance with the earnest solicitation of his studious friend, Morgagni was induced to impart his own extensive knowledge to him, in a succession of familiar epistles. When these letters were returned to the author for the purpose of publication, his correspondent expressly stipulated that they should not be curtailed or materially altered. From the papers of his predecessor Valsalva, Morgagni selected a great number of the cases; many were contributed by his friends; but most of them fell under his own observation. Following the plan adopted by Bonetus, he has arranged these facts according to the organs in which the principal lesions were seated. The work appeared in 1760, when the author had nearly attained his eightieth year; and it has been universally acknowledged, that, owing to the greater accuracy of his details, this collection of dissections is far more valuable than any which preceded it; nor am I acquainted with any parallel work which has subsequently appeared.

That it has many imperfections cannot be denied. The symptomatology is often imperfect, especially in those cases which had been

recorded by Valsalva. It does not always exhibit accuracy of discrimination; the principal diseased appearances are frequently obscured by undue notice of collateral circumstances; the arrangement is confused; and the language is exceedingly diffuse and intricate. But after every deduction, Dr. Baillie, one of the most competent judges, observes respecting this stupendous work that "*when considered in all its* "*parts it would be difficult to bestow upon it too* "*high praise.*"

In 1769 Dr. Benjamin Alexander published a translation in three volumes quarto, and considering the great extent of the task, he certainly accomplished it with great ability. Hitherto, however, their extreme bulkiness has prevented both the original and the translated copy from being generally in the hands of practitioners: and when they have been accessible, the exuberance of style and matter has been an almost insuperable obstacle to perusal. Consequently this production has been subject to the anomaly of possessing matter so valuable as to constitute it the principal work of reference on morbid anatomy, whilst few persons have had sufficient perseverance to read it through.

But notwithstanding this, copies of the original and of the translation have become exceedingly rare and expensive.

Under these circumstances it has long appeared a desideratum to divest the work of the extraneous and redundant parts, and retain those facts which constitute its intrinsic excellence. This was an enterprise of considerable responsibility, and I should have been highly gratified had the task been assigned to another individual—to one in whose hands this production of the greatest anatomist of his age might have been made appear to the utmost advantage. So deeply, however, am I convinced of the real merits of the original work, and also of an abstract having long been needed, that I console myself with the assurance that my undertaking an abridgement was not a work of supererogation, even though the execution may be accompanied with obvious defects. I shall also experience the satisfaction of having devoted my leisure hours to an object pleasant and useful to myself, and I hope, in a degree, beneficial to society. Should this performance be so far received with candour as, at any future period of my life, to warrant another edition, no

exertion shall be wanting to free it from imperfections, many of which will doubtless be detected on the present occasion.

Owing to the perplexities of Morgagni's style, and the numerous parentheses by which his periods are frequently prolonged, Dr. Alexander found the subject often rendered extremely intricate. "The difficulty of translation" says he, "has been much insisted on. For where "it has not been easy to conceive of an idea "it must of course not be easy to represent "and convey it properly to others. Indeed "this difficulty of translation has been uni-"versally acknowledged by all persons well "acquainted with the nature of the work in "question, and so far has the conviction been "carried by a gentleman eminent for his "learning and abilities, as to make him assert "that it could not be translated by any one "whatever."

Although in consequence of Dr. Alexander's having followed his author by a literal interpretation, most of the obscurities in the original pervade the translation, yet I have found the latter of essential assistance. Indeed, before I had fully determined upon publishing an

abridgement I had condensed the epistles from that translation; but when I afterwards resolved on submitting the work to the public under another form, I went over the ground a second time, carefully examining the original as well as the translation. My epistolary abridgement from Alexander, however, had convinced me that to render the work at all suitable to the present time, considerable freedom should be indulged. I have, therefore, not considered myself bound to give a literal interpretation when it appeared practicable to express the same idea more precisely in fewer words—nor have I always followed Morgagni's order in describing the particulars of individual cases. In exercising this freedom I have incurred more responsibility, and exposed myself to much additional labour, but I trust it will appear that by this means greater perspicuity has been gained without any sacrifice of faithful description. In the arrangement of the whole I have not studied nosological order, but following Morgagni's general divisions, with the exception of the last chapter, I have divested the work of epistolary desultoriness, and have endeavoured to throw its contents into a natural and available,

if not a very methodical series of sections. To all the observations derived from Valsalva's papers I have affixed his name; and, to the remainder, the name of Morgagni is attached, though in this number those cases are included which he derived from his friends, or has quoted from medical records. In general, however, if not uniformly, the authority for the cases and observations which are not his own, is distinctly mentioned. I have likewise subjoined to every case and paragraph a reference to the corresponding epistle and article in the original work.

Sometimes the accuracy of the rationale annexed to the cases may be open to objection. It has been impossible totally to exclude opinions on which a diversity of sentiment is entertained, but as often as possible, when the subject appeared of sufficient importance to require it, I have inserted an explanatory note. Occasionally too a degree of abruptness or want of connexion will be detected, for I have uniformly determined to preserve a valuable fact, though it might be necessary to reject so much of the accessory matter as nearly to insulate the fact itself. With respect to proper

names I have thought it best to follow Dr. Alexander.

At the commencement of my labours, I did not intend to make any considerable addition by means of notes; but in the progress of transcription for the press, it appeared to me that the value of the publication would be enhanced by indulging greater latitude of annotation than was at first contemplated. But the work had then been announced, and I was somewhat pledged for its early appearance: consequently I could only avail myself of a very hasty selection from my own journal, or from publications to which I had immediate access. Under these circumstances I must bespeak the utmost indulgence with respect to the notes themselves, and their distribution. I felt that the work was not one of theory and hypothesis—not one replete with matters of mere speculation—but a record of valuable facts; and therefore my annotations chiefly consist of what has actually passed under observation, or of opinions deduced from experience and observation, and recognised as good authority. I might have considerably enlarged the number of my own dissections,

had I not been restrained by the necessity of limiting the extent of the work, which indeed, now very much exceeds my expectations.

Valsalva and Morgagni were so distinguished in their professional career that works of general, as well as of medical biography have usually noticed them. But, notwithstanding this, it may not be improper to prefix a very concise account of these admirable examples of industry and excellence. It will scarcely be possible to speak of them without alluding to a third individual, namely Malpighi, from whom Valsalva received his first anatomical instruction: and I must also advert to the seats of learning in which their talents were chiefly employed, namely, Padua and Bologna. This account will familiarize the reader with personages whose names perpetually recur in the following pages; and also with places the names of which are not less frequently reiterated.

Padua is a city of considerable extent in Italy, and is supposed to contain about thirty-eight thousand inhabitants. The university was founded by Charlemagne, and was much enlarged by the Emperor Frederick II. and

Pope Urban IV. but it has recently declined much from its former reputation. The number of students who formerly resorted to this university exceeded a thousand, but in 1814 they had dwindled down to three or four hundred. This unhappy change does not appear to have resulted from a deficiency of talent, but energies had been paralysed by the circumstances of the times. The hospital is large and commodious, and, it is said, nothing is wanting but the countenance of government, to enable this once celebrated school to resume its rank.

Bologna, the capital of the Bolognese Dutchy, is, next to Rome, the largest, the finest, and the richest city in the Ecclesiastical state. The number of its inhabitants is estimated at 80,000. The university of this city is one of the most ancient and likewise one of the most celebrated seats of literature in Europe. It was founded, as some say, by the Emperor Theodosius, in 433, but others, with greater probability, attribute it to Charles the Great; and before the general diffusion of knowledge thousands of scholars crowded its seats. In the year 1315 Mondini de Lazzi, a professor of medicine at Bologna, publickly dissected two human

subjects, and wrote a description of them. During the fifteenth century the practice of dissecting human bodies gained ground in all the universities, and when Carpi, then a celebrated physician at Bologna, dissected them, which he did as often as circumstances allowed him, we are informed that the dissections were not regarded by his learned brethren with wonder. In the reformation of medicine here, no person appears to have assisted more than Petrarch the poet. Over the gate of the magnificent edifice appropriated to the Academy of Sciences is the following liberal inscription.—*Bononiense Scientiarum atque artium institutum ad publicum totius orbis usum.* The anatomical theatre is adorned with statues of celebrated physicians, and the museum supplies anatomical preparations, and a complete series of anatomical figures in wax.

Amongst the renowned individuals, who have held professorships here, stands the name of the *great Malpighi*, who ranks among the first physiologists of his age, and in his time this famous university was in the meridian of its glory. With his industry in the pursuit of science he combined a remarkable degree of

candour and modesty, and his publications were so truly interesting and important that his reputation extended with rapidity throughout Europe. Vallisneri had been a favourite pupil for some years, and when about to depart, Malpighi advised him to study nature, and to communicate matters of fact. "Systems" said he "are ideal and mutable. Observation and experience are solid and unchangeable."

Anton-Maria Valsalva was born at Imola, in Romagna, in 1666, and after having received the elements of literature in the Jesuit's Seminary, it was his privilege to be placed under the immediate patronage of Malpighi, but he applied so assiduously to study as to impair his health. At the age of twenty-one he took his degree, and practised as a physician and surgeon with high repute. In 1697 he was chosen professor of anatomy in the university, and under his direction the school acquired great celebrity, and some of his pupils became eminent in the profession. Of this number was Morgagni. The principal work published by Valsalva is a treatise entitled "De Aure Hu-"mana," in the preparation for which he dissected a prodigious number of subjects. He

died, like his preceptor Malpighi, of apoplexy, at the age of fifty-seven.

Giambatista Morgagni was born at Forli, in Romagna, in February 1682. He lost his father in his infancy, but his education was successfully conducted by his mother, and he displayed a proficiency in classical and philosophical acquirements beyond his years. He studied medicine at Bologna with great ardour, and soon attracted the attention and esteem of his able masters Valsalva and Albertini, the former of whom availed himself of his assistance in the researches into the organ of hearing which he was at that time prosecuting, and in drawing up his memoirs on that subject. Morgagni also performed the professorial duties during the temporary absence of Valsalva on a journey to Parma, and illustrated his lectures by numerous anatomical preparations. These illustrations, and the easy and perspicuous eloquence in which he addressed his auditors, added to his kind and engaging manners, obtained for him general esteem, as well as the friendship of the most distinguished philosophers of the place. His zeal in the pursuit of knowledge led him soon afterwards to travel. He first went to

Venice, where he cultivated several branches of natural philosophy; and afterwards he visited Padua, where he attended the schools, under the direction of distinguished professors, with his accustomed industry. Having completed his comprehensive course of study he settled for a short time at his native place; but, finding it too limited a sphere for his talents, by the advice of Guglielmini he returned to Padua. Here he did not long remain unoccupied. In consequence of the death of his friend, whose name has just been mentioned, Vallisneri was advanced by succession to the chair previously occupied by the deceased professor, and Morgagni was nominated to the vacant chair, and taught the theory of medicine. This appointment occurred in 1711. He became the intimate friend of the celebrated Lancisi, whom he assisted in preparing for publication the drawings of Eustachius, which appeared in 1714. He had already distinguished himself by the publication of the first part of his own work, the "Adversaria Anatomica," Bonog. 1706, 4to. which was remarkable for the originality of its execution, and for the accuracy as well as the novelty of the observations which it contained.

He published successively, from this time to 1719, five parts of this important work, which contains numerous discoveries in different parts of the human body, most correctly detailed. The progress of the work had extended his reputation throughout Europe, and in 1715 his talents were rewarded by an appointment to the chief anatomical professorship in the university of Padua. Henceforth, to the close of a long life, he ranked deservedly at the head of the anatomists of his time. His knowledge was by no means limited to professional subjects; for he was well versed in general literature, and was a proficient in history and antiquities. Literary honours were accumulated upon him from every quarter of Europe. He was elected a member of the Academia Naturæ Curiosorum in 1788, of the Royal Society of London in 1724, of the Academy of Sciences at Paris in 1731, of the Imperial Academy of Petersburgh in 1735, and of the Academy at Berlin in 1754; and he was one of the first associates of the Institute of Bologna. All the learned and great who came into his neighbourhood visited Morgagni. He was likewise honoured with the particular esteem of three successive popes; and his native

city of Forli placed his bust in their public hall, during his life, with an honorary inscription. In a word, both at home and abroad, the character of this distinguished man was held in the highest estimation, and the writings of his most eminent contemporaries have borne testimony to his various merits. He married a lady of noble family at Forli, by whom he had fifteen children, eight of whom survived him. He was of a robust habit, tall, and of a lively and agreeable countenance; and his other virtues were enhanced by his great modesty. By his professional labours, and a life of frugality, (indeed an excess of this has been accounted one of his foibles,) he accumulated considerable property, and died about the end of 1771, at the advanced age of ninety years, but in the possession of his faculties.

In addition to the Adversaria which has been already mentioned, Morgagni published the following works. "In Aurelium Celsum et "Quintum Serenum Sammonicum Epistolæ "quatuor," 1704; "Nova Institutionum Me-"dicarum Indea," Patav. 1712, which was written on his appointment to the theoretical

chair, and teaches the proper method of acquiring medical science; "Vita Guglielmini" prefixed to an edition of the works of that physician, Geneva, 1719; "Epistolæ Anato-"micæ duæ, novas Observationes et Animad-"versiones complectentes, quibus anatome "augeter, &c."—which was edited at Leyden by Boerhaave, and relates chiefly to a dispute with Bianchi on the structure of the liver; "Epistolæ Anatomicæ xviii. ad scripta perti-"nentes celeb. Ant. Mar. Valsalvæ," 2 vols. 4to, Venice, 1740. Of his work "De Sedibus "et Causis Morborum" I have already spoken. Morgagni's last publication, "Opuscula mis-"cellanea, quorum non pauca num primum "prodierunt," folio, appeared in 1763, and contains dissertations on the lachrymal ducts, on the glands, on gall-stones, and urinary calculi, in addition to his first critical dissertations on Celsus. In 1765 a complete edition of his works was printed at Bassano in five volumes folio.

Were I to close these preliminary observations without a grateful recognition of the distinguished sanction I have received, it would be a dereliction of duty to my subscribers, and an omission altogether uncongenial with my

own feelings. Many individuals whose names it would be improper for me to proclaim, are entitled to my warmest thanks. But I cannot deny myself the pleasure of distinctly expressing my obligations to one individual of deservedly high reputation—an individual not more eminent for a long and skilful as well as ingenuous exercise of professional duties, than distinguished for his ardour to elevate the Medical character, and to improve the science and institutions of Surgery—I allude to Sir William Blizard—of whose urbanity and kindness it would be impossible for me to speak too strongly. Nor can I forego the peculiar satisfaction of stating that my labours were in no small degree encouraged by the Court of Assistants of the Royal College of Surgeons, who very early after the first intimation of my design, transmitted their sanction independently of any application from me. In this liberal act the executive power of that noble Institution have demonstrated their solicitude for the advancement of professional science, and their promptitude to promote exertions for the diffusion of that knowledge which is adapted to increase the efficiency of the practitioner,

and which, consequently, is conducive to the welfare of society.

My thanks are also due to many professional friends who, in past years, have kindly invited me to assist them in their examinations of the dead body, or to perform the inspection for them. I shall always gratefully avail myself of such means of extending my acquaintance with morbid anatomy, and shall thankfully accept any specimens of diseased structure.

I exceedingly regret that my announcements relative to the time of completing the work, were not strictly complied with; but the delay of publication has arisen from a variety of circumstances altogether uncontrollable.

W. C.

67, *Great Prescot-Street,*
June 20, 1822.

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* In a few other places also where it applies to the intestine.
† In a few other places where the meaning is obviously adverbial.

CHAPTER I.

ON THE DISEASES OF THE HEAD.

SECTION I.

Phrenitis and Delirium.

THERE may appear some incongruity in associating inflammation of the membranes, or of the substance of the brain, with a state of the mental faculties which often arises under circumstances not of an inflammatory character: but, as delirium was a prominent feature in the succeeding histories, I shall place them under that general designation, to shew the diversity of morbid changes by which it may be occasioned. More precise observations on the pathology of fever will be adduced in another part of the work.—*Ed.*

Case 1.

Delirium, from inflammation of the dura and pia mater.

A woman who had long been in the hospital at Padua, in consequence of injury from a blow on the head, was dismissed cured. She was afterwards attacked with fever, became delirious, and died.

Dissection. There was no particular mark of the blow. The internal surface of the dura mater

exhibited numerous scarlet spots, like drops of blood; the vessels of the pia mater were turgid; and serum was deposited beneath that membrane. There were vesicles in the posterior part of the choroid plexuses; the cerebellum was somewhat flaccid.—*Morgagni, Epist.* vii. 15.

Case 2.

Delirium from turgescence of vessels in the pia mater, and deposition of serum.

A man in his eightieth year was admitted into the hospital of St. Mary de Morte at Bologna, under a variety of slight diseases; whilst there, his pulse became frequent, quick, and full; delirium followed; he had convulsive tremor in the lower maxilla and limbs. Within two days his respiration became stertorous, and he died.

Dissection. The body was examined fourteen hours after death, when the viscera were still warm.

The intestines were slightly red; the edge of the liver was livid; the coats of the spleen were cartilaginous. The right lobe of the lungs adhered to the costal pleura, and a portion of it was indurated. The mitral and aortic valves were indurated, but not ossified; the trunk of the aorta was occupied by some bony scales, in the intervals of which the inner coat was destroyed, and the second coat appeared in a state of ulceration.

When the head was detached from the spine a little fluid escaped from the spinal canal, and a large quantity from the foramen magnum of the occipital bone. The dura mater appeared corrugated, in consequence of the previous escape of

fluid. In the convoluted furrows of the brain beneath the pia mater, and in the ventricles, some bloody fluid resembling water in which fresh meat had been washed, remained; the vessels of the pia mater were loaded with black and coagulated blood; the substance of the cerebrum and cerebellum was flaccid; that of the latter to a great degree.

Morgagni, vii. 9.

Case 3.

Delirium from turgescence of vessels and deposition of serum; with diseased liver and lungs.

A potter, seventy years of age, of vivacious disposition, and addicted to drinking, after much anxiety of mind and fatigue in business, was attacked with violent pain in his left side accompanied with fever. He was received into the hospital about the fifth of April 1706, and was bled. On the fourth day his fever had increased; on the sixth he became delirious, so that it was necessary to bind him in bed.* His pulse was quick and respiration difficult. Bleeding was again resorted to, but on the following day respiration became stertorous and terminated in death.

Dissection. The upper parts of the body were yellow as in jaundice, and the other parts were slightly tinged with the same colour; the omentum was drawn upwards; the liver adhered to the diaphragm by its whole upper surface; the edge of

* It is still not unfrequent to bind, or, at least, to coerce patients, in delirium. I have known cases in which this practice has proved extremely injurious; an opposite plan of treatment, under careful management, is very salutary.—*Ed.*

this viscus was livid whilst the rest was variegated like marble; the whole texture was indurated: there was but little bile in the gall-bladder, and that resembled turbid bloody water. The coats of the bladder, and the urine it contained, were of a yellow colour.

In the left cavity of the thorax there was a considerable quantity of yellowish serum; and portions of lymph were concreted upon the surface of the lungs; the inferior lobe was almost entirely indurated; when cut into, its structure was nearly as compact as liver, which evidently arose from inflammation; in some parts suppuration had commenced. The pericardium contained a small quantity of yellowish serum, and its vessels were turgid with blood. The upper part of the pleura was thickened.

The vessels of the pia mater, on the left side, were greatly distended with blood. There were some hydatids on the choroid plexuses; on the surface of the brain a large quantity of serous fluid was deposited, and a small quantity in the ventricles.—*Morgagni*, vii. 11.

When phrenitis supervenes upon peripneumony it is attended with peculiar danger. During an epidemic inflammation of the lungs, in 1754, whenever delirium came on the patients never escaped.*

---

* It cannot be doubted that urgent danger usually attends such cases, but they are not necessarily fatal. *Ed.*

Case 4.

Delirium from turgescence of vessels in the substance of the brain; and deposition of serum.

A man, thirty-five years of age, was attacked with violent febrile symptoms and became delirious; his eyes glistened and the arteries pulsated with vehemence. He died.

Dissection. The vessels distributed through the substance of the brain were distended with blood; the ventricles contained a small quantity of serum. With the exception of some coagula in the heart all the blood of the body was in a fluid state.

Valsalva, vii. 7.

This is the only case of delirium in which Valsalva found the vessels in the substance of the brain distended with blood. It has, however, occurred to me to find these vessels in a turgid condition when uncombined with inflammation in the meninges; sometimes, in phrenitis, I have found the membranes alone affected, but more frequently the inflammation affects the membranes and structure of the brain at the same time.

Morgagni, vii. 8.

Case 5.

Delirium in fever from deposition of serum.

A porter, whilst labouring under ardent fever, was seized with violent pain in his head, to which delirium and death succeeded.

Dissection. A small quantity of serum was deposited between the membranes of the brain, part of which amongst the blood vessels presented the

appearance of jelly. The sinus of the falx contained a thin and long coagulum of blood, an appearance which has not unfrequently been mistaken for worms.—*Valsalva*, vii. 6.

SECTION II.

Diseases in the Membranes of the Brain.

Case 1.

The dura mater nearly ossified in an idiot.

The body of a beggar was brought into the anatomical theatre in 1728. He had always manifested fatuity, and for a short time before death became so irrational as to throw away the bread he had begged. He had been liable to obstruction of the bowels as well as pain of the head.

Dissection. The dura mater was firmly attached to the skull on the left side of the forehead, and to some extent this part of the membrane was converted into a structure betwixt bone and ligament. Although the cerebellum was soft and flaccid, and the medulla oblongata not very firm, yet the cerebrum was indurated, as it is frequently in idiots. There was a little limpid water in the lateral ventricles; the plexuses were colourless; some vesicles appeared on them which contained limpid fluid like that in the ventricles.

Morgagni, Epist. i. 10.

Case 2.

Ossification of the falx.

A nobleman, descended from a father who had been subject to pain in the joints, and catarrh, who was almost from childhood affected with cutaneous diseases, and in his youth had often contracted gonorrhœa and chancres, and who ultimately experienced pains similar to those of his parent. Amongst other means, for the removal of the latter, he resorted to the mud and baths of Verona, which he used in excess, and soon afterwards began to suffer pain in the head, accompanied with a sensation of plenitude, with ophthalmia, and occasional epistaxis. By constant cares and deep thought, the head became still more infirm; the hæmorrhage from the vessels of the nose often recurred, with frequent and sudden flushing of the face, sense of heat in the head, and of debility in the occiput; and all these symptoms were aggravated when the discharge of urine or fœces was diminished. About seven months previous to death, as often as he went up stairs, or walked quickly on an even surface, or moved his arms as we usually do when putting on our clothes, a troublesome sensation of coldness was excited at the lower part of his sternum. This sensation was gradually changed, so that at the expiration of one or two months, a most acute pain was felt instead of the coldness, and appeared to the patient to ascend to his head, occasioning the immediate suspension of sight, pulsation, and sensibility—he fell into a state of syncope. Although at first these symptoms only

supervened on those motions which have been related, yet he afterwards experienced similar paroxysms even without motion.

It was occasion of surprise that he did not undergo these paroxysms from some of the more violent motions, as sneezing and coughing; they did not create the least inconvenience.

Often, both in the night and the day, the whole body became convulsed; at other times the convulsive action was limited to a part, especially the eyelids and left arm; at one time a finger of the right hand was affected with painful spasm, at another the same hand and the corresponding leg became numb; sometimes the sense of feeling was abolished in both arms, at others they were the seat of pain. Not unfrequently he had pain in the forehead, or a sense of constriction in the occiput; and all these symptoms promiscuously distressed the patient to the day of his decease, although, to that day, his appetite was unimpaired, he slept soundly, the aspect of his body was natural, and the vivacity of his intrepid mind was unsubdued.

Dissection. All the abdominal and thoracic viscera were in a healthy state; and all the parts within the cranium were free from disease except the falx, in which were five bones of different figures and magnitude, and almost all of them rough with prickly points. The largest of them was fifteen lines of Bologna in length, seven broad in the middle, and one and a half thick. The five occupied more than two thirds of the falciform process, beginning from the anterior part and proceeding backwards. Besides these was a bone

the size of a lentil which probably had been formed last.—*Valsalva*, xxv. 6.

Examples are not wanting of bones found in the falx from which no inconvenience had resulted, which my own observations have confirmed. Besides other instances I met with bones in that membrane in a man and woman whose bodies I dissected in 1726 and 1744. In the former a bone was situated on each side of the longitudinal sinus, in the very substance of the dura mater, of no inconsiderable size, one of which terminated in oblong and acute teeth; in the woman there were three little bones; I could not learn the precise circumstances of either before death, except that the woman, who was a beggar, died from hœmoptysis. Although when these bones irritate the membranes, the consequences are extremely injurious; yet unless this happen, or they compress one of the sinuses, scarcely any evidence of their existence will be afforded.

I have never found any bony scales in the membranes of the brain, but genuine bone, and which I have also found in the vertebral canal. Its seat in the latter instance coincided with the eleventh dorsal vertebra, and its figure resembled that of a gourd seed.—*Morgagni*, xxv. 7, 8.

Case 3.

The dura mater thickened, and united with the pia mater.

A woman who had been affected with the venereal disease, and afterwards with fever, united with

severe pains in the head and delirium, died under this complication of disease.

Dissection. The skull, when opened, appeared of a darkish red colour in some places, and the dura mater contiguous to the right lateral sinus, was much thickened, and was united with the pia mater and substance of the brain; the membranes and brain, in that part, were nearly putrid; the external surface of the cerebellum was likewise so firmly connected with the two membranes, that when drawn out from the cavity of the dura mater, a part of its substance, about the breadth of two fingers, was left adhering to the membrane; the vessels of the pia mater, and of the substance of the brain, were unnaturally distended with dark blood; the ventricles contained a brownish fluid, and the membrane of these cavities had the same colour. The pineal gland was enlarged; it was more firm and of a whiter colour than usual, and appeared cellular.—*Morgagni*, i. 14.

A case is related in the Ephemeris Cæsareæ Nat: Cur: Academiæ, in which, from exostosis, the membranes almost equalled the breadth of a finger in thickness, and had the appearance of fungous flesh. 16.

Case 4.

Pus secreted by the pia mater during inflammation.

A young woman, who was the wife of a poor man, and whose mother had been epileptic, having been extremely heated during a journey, was seized with violent pain in the head, and acute fever. She had no delirium, but often was reluctant

to speak. Under these symptoms she died in three or four days. As she was menstruating and suckling she was not bled until a short time before death.

Dissection. The head only was inspected. The interior of the cranium had a brownish red appearance, and the external surface of the pia mater was smeared over with a small quantity of a yellowish kind of matter, thick and inodorous. It seemed to me, and to other physicians and surgeons present, to be pus, which had been secreted by the inflamed membrane.—*Morgagni*, i. 12.

Case 5.

Congestion of blood, and dilatation of vessels, in the membranes.

We shall only give two examples, from a considerable number, in which much pain arose from this condition of the membranes. A man who from early life had been liable to headach in a violent degree, died. The vessels of the dura mater were so distended as to equal the size of a goose-quill. It was evident that this state of the vessels was not of recent occurrence, for the sulci in the inner table of the skull, corresponded with the size of the vessels.

In another case, which coincided with the former in the distension of vessels, the determination of blood to the head was the consequence of obstruction to the free circulation of blood through the abdominal aorta.—*Morgagni*, i. 17.

Hairs. On one occasion I found a small bundle

of hairs within the dura mater; others have found hairs even within the ventricles of the heart.

Morgagni, xxiv. 4.

Worms. Many cases are on record of worms found in the sinuses of the brain. It is probable that they were merely concretions of lymph. Narrations of worms crawling from the frontal sinus are authenticated by numerous testimonies, and have been ascribed to the ova of insects drawn in during respiration, or whilst smelling flowers with a strong inspiration. Boerhaave mentions a girl, cured by him, whose pituitary sinuses were full of worms. The frontal sinus has been trephined where worms have been suspected, and other means had failed to remove them.—*Morgagni*, i. 9.

Irregularities have often been observed in the structure of the cranium which did not result from disease. The cranium has been found extremely thin, being more pitted than usual. In some of the pits the bone was merely a thin lamella, sometimes even perforated.—*Morgagni*, lxiii. 8.

The frontal and sphenoidal sinuses have been wanting. The styloid process has been found four inches in length, but this has been the result of ossification of the ligament, the ossification being then complete; in other cases it has been observed only ossified in parts.—*Morgagni*, lxiii. 13.

SECTION III.

Hydrocephalus.

Accumulations of a serous fluid in the head arise under circumstances which have given occasion to a division into the acute and chronic forms.

Acute Hydrocephalus.

Case 1.

An intelligent boy, thirteen years of age, whose brother and sister died of phthisis, was seized with pain in his forehead. His eyes also were painful, and discharged a viscid secretion. The following day he became delirious, his eyes were fixed, and he vomited a little tenacious matter. He was then seized with convulsions, and sunk into lethargy; from which, however, he was often roused by convulsions, attended with difficulty of respiration. He died.

Dissection. The stomach contained greenish matter; the upper part of the right lobe of the lungs was occupied by a suppurated tubercle, the size of a walnut, resembling in colour and consistence the medullary substance of the brain. In the pericardium there were about two ounces of serum. The dura mater was tinged of a cineritious colour along the sides of the blood vessels. When the dura mater was torn from the crista galli a little puriform serum burst forth, and about an ounce of limpid serum escaped by the roots of the optic nerves. The pineal gland was unusually large.

Valsalva, Epist. i. 2.

The green appearance in the stomach arose from bile which had been urged thither during the efforts to vomit, as the gall bladder was turgid with bile. *

Case 2.

Aloysius Ratta, advanced in years, having long been hypochondriacal, and liable to vertigo, in the summer of 1705, became excessively thirsty, and in November following was suddenly seized with delirium, and afterwards with coma. He died in about two days.

Dissection. No disease was discovered in the abdomen. Serum was deposited among the convolutions, in the ventricles, and at the basis of the brain; but not in large quantity.—*Valsalva*, vi. 2.

Cheselden asserts that he had always found much fluid in the brain on the dissection of lethargic patients.

Case 3.

A man, nearly sixty years of age, who was addicted to drinking, was brought into the hospital at an advanced period of acute fever. He was somewhat comatose, and when spoken to scarcely answered. He frequently tossed off the bed clothes. The temperature of the body was rather cold. His pulse was irregular. Death happened about the fourteenth day.

Dissection. The stomach and intestines were found slightly red. On opening the cranium a

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* The strumous diathesis, so liable to hydrocephalus, seems to have existed here.—*Ed.*

little limpid serum escaped; the pia mater appeared slightly inflamed; the interstices of the convolutions were full of serum; a little serum, tinged with blood, was also found in the ventricles. The inflammation of the stomach and intestines, as well as of the pia mater, appeared to be of the erysipelatous kind.—*Valsalva*, vi. 8, 9.

Case 4.

Hydrocephalus from diseased liver. *

A man, about forty years of age, who for many years was liable to periodical pain in the right hypochondrium, frequently attended with vomiting, and sometimes with ileus and delirium, had, almost constantly, violent pain in the head. The eyes discharged a serous fluid. After excess in drinking wine, he suffered an attack of pain and vomiting, and although temporarily relieved by an empirical unction, the pain recurred, accompanied with delirium and convulsions; the latter ceased about an hour before death, on his becoming apoplectic, when his respiration was oppressed; he foamed at the mouth, and his pulse was strong and full until death.

Dissection.—The liver was indurated, and the abdomen contained a small quantity of serum.

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* Whilst it cannot justly be doubted that hydrocephalus results from different morbid conditions of the brain, it appears equally certain that it often arises from disease or disordered function in the abdominal and other distant organs. When there is evident disease in the head, and at the same time derangement in the functions of some other viscera, the abdominal for instance, it is often difficult to decide which part was primarily affected.—*Ed.*

Serous fluid was deposited beneath the pia mater and in the ventricles of the brain.—*Valsalva*, i. 5.

The pain in the intestines, and occasionally inverted action, may be referred to the morbid bile secreted by the diseased liver, and conveyed into the duodenum. There is adequate reason to believe that the affection of the brain was consequent to the abdominal disease.

Case 5.

Hydrocephalus from peripneumony.

A foreigner, apparently about fifty years of age, died in the hospital at Padua, of inflammation of the lungs, which, during four days previous to death, had been united with coma.

Dissection. A large quantity of yellow serous fluid was deposited beneath the pia mater, and some fluid was contained in the ventricles of the brain. The vessels were turgid with blood. The yellow colour of the fluid was probably derived from bile, which has been affirmed to possess a narcotic principle.

The obstructed circulation through the lungs would have a tendency to retard the return of blood from the head, and by this means give rise to serous effusion.—*Morgagni*, vi. 14.

Case 6.

Hydrocephalus from diseased liver and lungs.

A man, sixty-nine years of age, of pallid complexion, and who had complained for some time of slight pain in his neck, was received into the hospital at Bologna. He was weak; his pulse

was small and frequent, and although his organs of sense were unimpaired, he was dull of comprehension; the pain of the neck abated. After some days he complained of pain beneath the sternum; to relieve which, blood was withdrawn, and the pain ceased. Stertor, and noise of mucus in the trachea succeeded, and continued two days; the pulse vibrated. He chiefly complained, however, of sense of weight in the head, and of an internal pricking in the right temple. He usually lay on the right side. The stertor of respiration, and the vibration of the pulse decreased, but he appeared to us still in precarious circumstances. Four or five days afterwards he was found in a state of coma, and died the following night.

Dissection. The liver was of a pale colour and somewhat indurated; the gall bladder was distended with bile. The right cavity of the thorax contained a considerable quantity of turbid serum, having a somewhat puriform appearance; the left contained some bloody serum. The left lobe of the lungs was united with the costal pleura, and part of its upper surface was indurated—the result of old disease. In the part where it adhered to the pleura, and throughout the greater part of its substance, this lung was dense and heavy. It had a fleshy colour externally, and when cut into, it seemed to be made up of fleshy particles clustered together like globules, the vessels being of a deeper black colour, and more turgid than usual Betwixt the membranes of the brain, and under the pia mater, there was a considerable quantity of fluid, some of which was even deposited within the

texture of this membrane, where, being contained in cells, it presented a gelatinous appearance, although it was perfectly fluid. There was a little bloody fluid in the lateral ventricles; the plexuses were not pale, but there were some cysts upon them.—*Morgagni*, vi. 12.

From three cases which fell under his notice, Preussius inferred that where the pain is confined to one side of the head, the ventricle of that side only is distended with fluid; or when the pain is chiefly on one side, that ventricle will be found more distended than the opposite.—i. 7.

Case 7.

Hydrocephalus, in which the usual symptoms did not exist.

An elderly woman whose limbs had been ulcerated for a long time, but which had gradually ceased to discharge, progressively sunk to her grave as if under the pressure of age.

Dissection. The liver and spleen were somewhat enlarged, and their structure not entirely natural.

The pelvis and ureter of each kidney were dilated.

The lateral ventricles of the brain were full of turbid serum, and the plexuses of a pale colour; the corpora striata consisted almost wholly of cineritious substance; no medullary striæ were visible, but only specks of that substance, and which were distant from each other; the cerebellum and medulla oblongata were flaccid.*

Morgagni, xii. 2.

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* Enough has been said on the subject of water in the head to shew its diversity of origin and symptoms. Various other sources

Chronic Hydrocephalus.

Sometimes fluid has been deposited between the cranium and scalp, but neither Valsalva nor Morgagni had an opportunity of examining bodies in which such accumulations existed. Morgagni had seen the disease and cured it. †—xii. 1.

Cases of chronic internal hydrocephalus have often been examined. In fœtuses which Morgagni supposed to have perished from hydrocephalus, it appeared as if there had been no brain. The upper part of the head was exceedingly depressed; a thick membrane firmly adhered to the hairy scalp; there was no appearance of the upper part of the skull; no cerebrum, but merely a kind of bladder containing a yellowish fluid; disjoined from this bladder, which occupied the anterior parts in the basis of the cranium, a small substance was observed, not larger than the kernel of an almond, which, perhaps, represented the cerebellum. In other cases the fluid appeared to have entirely escaped.—xii. 6.

The brain is not only extenuated and dissolved by the water, and the bones of the fœtal cranium disunited, but the bones of the face and body are

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might be adduced, but I shall advert to none except the abuse of mercury as stated by Dr. Blackhall. It has been said, that the fluid in the heads of hydrocephalic patients never jellies by heat; but that author has rendered it probable that the urine will sometimes coagulate.—*Ed.*

† I have recently attended an interesting little girl about four years old, whose head, two years ago, was greatly enlarged from this species of dropsy, from which she perfectly recovered under the use of purgatives and digitalis.—*Ed.*

sometimes enlarged in the transverse, rather than in the longitudinal direction; a preparation of this kind of hydrocephalic monstrosity was in Morgagni's possession. *

In a fœtus which Morgagni dissected at Forli, there was no trace of cerebrum, cerebellum, or medulla oblongata; and merely a thin and membraneous rudiment of the spinal marrow. †

Instances are not wanting in which the fluid was deposited between the dura mater and cranium; between the membranes; and beneath the pia

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* The extent to which the brain may become extenuated in this form of hydrocephalus, and yet the intellectual faculties be retained, has often excited astonishment. The head has been found to contain twenty-four pints of fluid; and life has been protracted many years. A case is recorded by Michaëlis in which it continued for twenty-nine years, with natural pupil, good appetite, and sound memory. An extraordinary instance has recently been afforded in a child from Hanover, æt: eleven years and six months, who is carried about in a box for public exhibition. The head gradually enlarged from the age of eight months; the circumference above the ears is thirty-five inches; over the vertex and under the chin, thirty-nine inches; the bones of the lower and upper extremities are twisted from rachitis. Vision and hearing are perfect; the teeth have disappeared; the functions are natural, and the appetite voracious; it understands perfectly what is said, but has never been able to articulate. It has scarcely ever slept. Upon feeling the head, it was evident that the fluid was immediately beneath the integuments. The frontal and occipital bones were united by a bony ridge.

The progress of ossification in these heads is sometimes very curious from the numerous bony patches distributed upon the extended membrane.—*Ed.*

† Morgagni seems to have entertained the idea that these acephalous fœtuses had previously been hydrocephalic, an opinion for which there does not appear adequate authority.—*Ed.*

mater. Usually it occupies the ventricles, and such is the extenuation which occasionally results, that when surgeons have thought they merely perforated the dura mater, the brain itself, scarcely thicker than a membrane, was perforated also.—xii. 13.

In a man who died cachectic, Morgagni found the septum lucidum and fornix were extremely flaccid, and a little fluid was deposited between the two laminæ of that septum; the lateral ventricles at the same time contained bloody fluid.

lxiii. 8.

Amongst other causes of the accumulation of water in the head, hydatids should be mentioned; they have been found not only in the cranium, but in the brain of animals; and they have been discovered in the meninges of the human hydrocephalic fœtus. In a case recorded by Wepfer, the whole was a heap of compact vesicles full of limpid fluid.—xii. 6.

SECTION IV.

Spina bifida.

The chronic form of hydrocephalus is so often connected with fluid in the spinal canal, that the circumstance of their having been associated in one letter admits of easy explanation. Fluid may, however, be deposited in one independent of the other, and may happen in adults as well as in fœtuses and children. It occurs, indeed, with the greatest facility in fœtuses, because in them the bones of the vertebræ readily yield, like the bones

of the cranium. At one time some of the vertebræ are bifid; and at others, all of them. By the fluid pressing against the membranes of the medulla spinalis, a tumour is formed upon the posterior surface, proportionate to the quantity of water, as in hydrocephalus. The vertebræ are chiefly deficient in the situation of the spinous processes, not only because the bones are naturally disjoined in that part, but more particularly, in my opinion, because there is less resistance there than laterally, where the muscles and tendons are situated. Ruysch was surprised that this tumour did not more frequently protrude at the inferior and outer part of the os sacrum, where there is naturally an opening. But the tube of the dura mater containing the cauda equina does not descend quite so low; it has sometimes, however, been urged downwards. In a case of this kind, in which the dropsy was common to the cranium and spine, Genga punctured the tumour with extraordinary success. The hydrocephalus succeeded a contusion on the head, and about a month after it was discovered, the tumour at the os coccygis appeared. Although the child was nearly four years old, yet when pressure was made upon the head, serum escaped from the punctured orifice at the extremity of the sacrum. *—*Morgagni*, xii. 9.

There is naturally a little fluid in the spinal

* Sir Astley Cooper has endeavoured to appreciate two methods of treating cases of spina bifida, and communicated the results to the Medico-chirurgical Society. The *palliative* cure is by pressure; the *radical*, by puncture with a needle.—*Vid. Med. Chir. Trans. Vol.* 2.—*Ed.*

canal, and should this exceed the natural quantity, it may be considered as an occasion of hydrorachitis. The spine has been bifid in the neck and back at the same time.

When the tumour arising from spina bifida has appeared in the lumbar region, the nerves of the cauda equina have sometimes been irregularly distributed through the tumour.

It has been maintained that this affection of the spine was attributable to water deposited in the cellular structure surrounding the dura mater; it might, occasionally, be seated in that part, for sometimes, though very rarely, a recovery has ensued from puncturing the tumour.

In a case described by Hoffman the disease seemed to originate from injury received during a difficult birth; the tumour began to appear in the loins, where the chief injury had been sustained, a few days afterwards. It has already been observed that the cauda equina does not descend to the os coccygis, which circumstance will probably explain the reason of the greater protraction of life, which Ruysch observed, when the tumour was seated on this part. In such cases so many nerves are not protruded or injured, as in other cases; in consequence of which there is less probability of paralysis of the lower limbs, of the sphincter ani, and of the bladder, which in them is likely to happen. The life of the little patient, however, is usually cut short by convulsions and other consequences of injury to the nerves; and these evils happen more speedily, if the nerves are pricked in opening the tumour, or if they are exposed to the contact of air.

In the following instance the tumour of spina bifida was rashly opened.

A boy was brought to me having a tumour on the lumbar vertebræ, which was soft, and in many places translucent: at birth it was small, but within ten months it had grown to the size of a fist; the boy was strong, and was well formed, even in his lower limbs, although they were weak. I cautioned the parents not to have the tumour opened. A surgeon, however, who being ignorant of its nature confidently promised to cure the disease, was permitted to thrust a knife into the middle of the tumour, from which, at first, a considerable quantity of limpid fluid, and, towards the last, some bloody fluid escaped; he afterwards introduced a tent into the orifice. The child did not cease to cry; the body trembled; the face became pale and wrinkled, and death followed on the third day.

Dissection. The parietes of the tumour were collapsed and rugous, and consequently thicker than usual; if compressed a considerable quantity of fluid, in colour like pale urine, flowed from the wound; when its parietes were slit open the spinal marrow presented itself, invested with its pia mater, which was universally red from distended vessels; the medullary substance of the chord, as well as the nerves proceeding from it, adhered closely to the middle of the parietes of the tumour longitudinally; and it was manifest that the other coats had coalesced with the parietes.

Morgagni, xii. 16.

SECTION V.

Apoplexy.

The causes of this disease generally manifest within the skull are either extravasation or congestion of blood, or deposition of serum; hence the celebrated distinction of apoplexy into sanguineous and serous: but it will appear in the sequel, that apoplectic symptoms may arise from other lesions of the brain.

Sanguineous Apoplexy.

Case 1.

Apoplexy from extravasation of blood into the right ventricle, and laceration of the plexus choroides.

The cardinal Francesco Sanvitalis was a man of moderate stature, of muscular body, and florid countenance; his habits were studious; he was subject to gout; for some years he was teased with irritation in the fauces, and at intervals, with spasmodic affections of the face and hands. When he was fifty-five years of age, and suffering much anxiety of mind, he was attacked with vertigo. Although he was relieved from this affection, he had afterwards great mental depression, and a propensity to sleep. At the expiration of about twenty days he had recurrence of vertigo, accompanied with vomiting. Notwithstanding they ceased on the following day, the sense of feeling and the power of motion in the left side of his body were lost, and he lay in a state of coma; his respiration was natural; his pulse was full, strong, and frequent:

when roused by irritating the nostrils and the sole of the right foot, he was capable of expressing himself by signs, and by a few words; and these irritations had a happier effect after bleeding, especially about four hours after the right jugular vein had been opened on the sixth day from the attack of apoplexy, when his mental faculties and the power of speech were temporarily restored. A similar change happened on the following night; and, indeed, the recovery of his understanding was then more complete and of longer duration. From this period he gradually declined; he was seized, at intervals, with convulsive motions in the right side, especially in the hand and foot; his face and eyes were convulsed, and perhaps the heart itself, for often no pulsation could be perceived He died about the tenth day.

Dissection. Every thing appeared natural in the thorax and abdomen. The brain was flaccid; the left ventricle contained a little serum; and the right more than two ounces of coagulated blood; the plexus choroides was lacerated, and the posterior part of the parietes of the ventricle was deeply ulcerated.—*Valsalva*, ii. 9.

In this great man various circumstances concurred to the production of apoplexy—his studious habits, close application to important business, anxiety, and the gout. It will likewise be observed that the principal lesion was in the right side of the brain, whilst the paralysis resulting from it, was on the opposite side, a circumstance which will generally be observed in the following dissections.—10.

Case 2.

Apoplexy from extravasation into the right ventricle, with ulceration of the corpus striatum and of the plexus choroides.

A man sixty years of age, of sanguineous temperament, fell in walking, and struck his head violently against the ground; he was slightly stupified; there was contusion on his forehead; blood flowed from his nostrils; and paralysis of the left arm ensued. He was brought into the hospital Sancta Maria de Vita at Bologna; his face was florid; his respiration laborious; his pulse hard and moderately quick. On the fourth day he was speechless, and on the beginning of the fifth, he expired.

Dissection. The dura mater exhibited slight marks of contusion; in the right ventricle of the brain about two ounces of coagulated blood were found, and the corpus striatum, with part of the plexus choroides, was so much ulcerated that scarcely a vestige of it remained.—*Valsalva.* ii. 11.

In this instance the disease does not appear to be attributable to the fall, but the fall to the pre-existing disease.

Case 3.

Apoplexy from extravasation into the ventricles; with ulceration.

A woman, seventy years of age, perceived for some months a diminution in the powers of memory; her sight also was somewhat impaired, and as she walked, she scarcely lifted her feet from the

ground; she suddenly fell down and became paralytic in the whole left side of the body, and in the right arm; her face was pale, and her respiration natural. She lived nine hours.

Dissection. The ventricles of the brain were filled with fluid blood; the right was extensively ulcerated around the external margin of the corpus striatum and the thalamus nervi optici; the left thalamus also was slightly ulcerated; the plexus choroides could scarcely be observed.—*Valsalva*, ii. 13.

The condition of the ventricles explained the relative paralysis; and the lesion of the optic thalami elucidated the defect of vision. Out of twenty-three cases of apoplexy examined by Valsalva and myself, it happened that only three were in youths, and four in men. From this case of the septuagenarian it is evident that paleness of countenance affords no argument against the existence of sanguineous apoplexy. Extravasation of blood does not prove fatal at equal periods of the disease; in one of the preceding cases the patient lived only nine hours, and in the other ten days. One of the principal criteria by which the urgency of apoplexy is determined, is the state of respiration; but in the woman above mentioned, this function remained undisturbed.—*Morgagni*, ii. 14.

Case 4.

Apoplexy from extravasation into the ventricle, the consequence of ulceration.

An old man, long before his death had been attacked with apoplexy, from which the whole right side of his body continued paralytic.

Dissection. The inferior part of the left ventricle of the brain, with its choroid plexus, was found to be ulcerated; some coagula of blood were attached to the plexus, so that the apoplexy seemed to have originated from the ulceration of both these parts, and from the blood that was consequently effused into the ventricle.—*Valsalva*, ii. 15.

Case 5.

Apoplexy from extravasation into the right ventricle.

Anthony Tita, who in 1713 published the *Catalogum Plantarum Horti Maurocini*, seventy three years of age, strong and brawny, accustomed to exposure to the rays of the sun, and to the free use of undiluted wine, having recently complained of fulness in the vessels of the head, and being exposed during the fourth of May 1729, to an unusually hot sun, suddenly, in the evening, lost the use of his left limbs and tongue, so that his words were scarcely intelligible. I was immediately called to him; his intellects were then perfect; his countenance, respiration, and the temperature of his body, were natural; his pulse was full and strong; he complained of no pain or affection of the head, but was very sleepy. He was bled, and a purgative clyster was administered; when I had left, an emetic was improperly given to him, and soon after the agitation of vomiting, he became speechless, his respiration was stertorous, convulsions supervened, and he died the following day.

Dissection. The dura mater adhered much more closely than usual, to the calvarium, and was dark coloured from the turgescence of its smaller vessels;

the vessels of the pia mater were distended with blood. The right ventricle contained as much black and coagulated blood as would fill the shell of a hen's egg; and some blood was contained in the other ventricles. There were vesicles in the posterior part of each choroid plexus. It was probable that the blood had been effused from vessels ruptured in the left plexus choroides; but whatever might have been the immediate source of this extravasation, it is unquestionable that whenever a vessel has been ruptured, the utmost care should be taken not to agitate the circulation of blood by concussions, such as arise from vomiting, coughing, or sneezing. I knew a plethoric gentleman, who died from apoplexy, with which he was attacked whilst straining to expel fæces, and a similar catastrophe has happened during parturition.—*Morgagni*, iii. 11.

Case 6.

Apoplexy from extravasation into the right ventricle; with diseased liver.

A Danish ambassador, sixty-four years of age, who was known to have some induration of the liver, was suddenly seized with paralysis of the left side, and speedily afterwards with apoplexy, so that he died in eight hours.

Dissection. The liver was indurated. Many hydatids existed in the right plexus choroides, and more than four ounces of grumous blood were contained in the ventricle. *—*Morgagni*, iii. 18.

* It might perhaps be questioned whether Morgagni accurately discriminated between vesicles and hydatids; the former often appear upon the choroid plexuses; probably, the true hydatid, but

Case 7.

Apoplexy from extravasation on the surface, and within the substance of the cerebrum; and upon the cerebellum.

The subject of this case was a Venetian woman, fifty-five years of age, of florid countenance, rather tall in stature, and of plethoric condition of body. She had borne several children, and the abdomen had become so prominent as to disqualify her for active domestic duty; she was liable to severe pain in the colon—she drank freely of wine—became indolent—was inclined to sleep—and for some days she experienced troublesome noise in the head. About the third hour of the night she was seized with pain in the right temple and right eye, and afterwards became apoplectic. In about an hour she lost all control over her right hand; vomiting, and afterwards stertorous breathing came on, and she died in about six hours.

Dissection. The abdomen abounded with fat. Although thirty hours had elapsed since death, and the season was cold, some heat remained in

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seldom. One of the most striking cases of this kind which occurs to me is recorded by Valeriana Luigi Brera. The patient was fifty-five years of age, and died apoplectic. The ventricles were turgid with bloody serum; two large clusters of hydatids lay along the choroid plexuses, about two inches long, and each vesicle constituted an animal of very peculiar structure.—It had a head not unlike the tœnia; and a vesicle filled with water and beautifully organized; which was apparently formed by three distinct membranes, the *external,* delicate, transparent, and shining; the *second* consisting of minute circular fibres: and *lastly* a villous membrane, which invested the interior of the vesicle.—*Ed.*

the abdomen. The colon was so small as to resemble that of dogs; the vessels of the intestines were more turgid than usual; the spleen exhibited some bloody spots on its surface, and the gall bladder contained bile of a bloody appearance; there were some livid spots on the surface of the liver, but in other parts this viscus was unnaturally pale. On the side of the splenic artery there was an ossified hemispherical aneurism, full of coagulated blood. There was a small quantity of bloody fluid in the pericardium.

When the calvarium was removed, extravasated blood was observed through the dura mater, which was found to cover the whole right hemisphere of the brain; the vessels of the pia mater, distributed over both hemispheres, were turgid with blood, and on the external part of the right hemisphere, there were two or three foramina from which the blood had issued. These foramina communicated with a longitudinal cavity in the medullary substance of that hemisphere, capable of receiving two fingers, and which was full of grumous blood; a small quantity of blood had reached the right ventricle, and some from it passed through a laceration of the septum lucidum into the left. From some other source, blood was extravasated beneath the tentorium, which had diffused itself over the whole cerebellum; and, as far as we could see, a quantity of blood was extravasated upon the spinal marrow.

If any considerable extravasation of blood takes place into the spinal canal, death will result from compression of the nerves which proceed from the medulla spinalis.—*Morgagni*, iii. 2.

Case 8.

Apoplexy from extravasation beneath the dura mater, with ossification of the falx.

A man advanced in years died apoplectic after an illness of some days. The only information I could obtain respecting him was, that he had a strong pulse, but no difficulty of respiration.

Dissection. There was nothing unnatural in the abdomen. The lungs adhered universally to the costal pleura; the heart was extremely fat; the valve of the coronary vein was fixed and perforated with small foramina; and the left vertebral artery arose from the aorta itself, and not, as usual, from the arteria innominata.

In the head about half a pound of blood was effused between the dura mater and tunica arachnoides. Ossification had taken place between the duplicatures of the falx; the ossified part being three digits in length, and half that extent in depth, and moderately but unequally thick. The posterior right branch of the carotid artery was larger than usual.—*Morgagni,* iv. 20.

Case 9.

Apoplexy from extravasation beneath the pia mater, with pulmonary congestion.

A man, fifty-eight years of age, of sound constitution, but greatly addicted to the use of tobacco, fell whilst he was buckling his shoes. He neither spoke, nor moved any part of the body. His face became alternately pale and yellow; saliva flowed from his mouth, and he died within a quarter of an hour.

Dissection. No morbid appearances presented themselves in the abdomen. The inferior part of the lungs adhered to the diaphragm and back, and both lobes were extremely red from the blood which pervaded them; the right was so turgid with it that on being lacerated a very considerable quantity flowed out.

A large quantity of coagulated blood was found beneath the pia mater, on the anterior surface of the brain, especially on the right side; a little blood was contained in both ventricles, and the plexuses appeared to have been affected with inflammation.

Valsalva, ii. 19.

Case 10.

Apoplexy from extravasation into the substance of the left hemisphere of the cerebrum, with diseased liver.

A porter, a strong and muscular man, in the fortieth year of his age, died of apoplexy at the fourth hour of the night. He had not complained of any previous disease.

Dissection. The colon was greatly contracted, except at its extremities which were distended with flatus; and the internal surface of the ilium was of a dark red colour and swollen. The liver was indurated, and its external colour resembled a reddish marble variegated with white; internally it was like boiled liver; the gall-bladder contained bile of a deep green or blackish colour, and some black calculi of diverse and irregular figures.

On the right hemisphere of the cerebrum blood was extravasated under the pia mater; the vessels in this part were more turgid than on the opposite side. In the left hemisphere there was a large cell

full of a dark coloured, and half coagulated blood. The parietes of this cavity were lacerated in some places, and opened, through the corpus striatum, into the left ventricle, by a foramen large enough to admit the point of a finger. The septum lucidum having been lacerated, both ventricles were filled with bloody serum. The vessels of the cerebellum were very turgid on the left side.—*Morgagni,* iii. 4.

Case 11.

Apoplexy from extravasation upon the right hemisphere of the cerebrum.

An old mendicant, who ate plentifully, (as persons of this profession generally do) and took but little exercise, was seized with apoplexy; he was insensible, and entirely lost the use of his tongue and left side. He died within three or four days.

Dissection. Although before the head was opened, I had no information as to the immediate effects of the attack, yet from the appearance of a contusion on the left temporal muscle, which he received on falling, when he became apoplectic, I predicted that if the disease was from an appreciable cause, it would be found on the opposite side of the brain. As soon as the cranium was cut through, a quantity of serum, not very inconsiderable, flowed out of it. All the parts within the skull appeared unnaturally vascular; but on the right side the vessels of the pia mater were not only more turgid than on the left, but about two spoonfuls of blood were extravasated, and half coagulated, upon the surface of that hemisphere. A transparent serous fluid was observable through the pia mater, which

presented the appearance of jelly. Not only were the vessels in the substance of the brain considerably distended, but those also which are distributed upon the membrane of the ventricles. The ventricles did not contain much fluid, but there were small vesicles upon the posterior surface of the choroid plexuses.—*Morgagni*, iii. 14.

Case 12.

Apoplexy from extravasation into the right hemisphere of the cerebrum, extending to the left hemisphere.

A man, forty years of age, liable to vertigo from intemperate abuse of wine, was seized with apoplexy the beginning of February 1703. The left side was completely paralyzed, and the right was soon afterwards affected with slight convulsive motions; he became more heavily apoplectic, and died after the lapse of a short time.

Dissection. Even the smallest vessels of the pericranium were so turgid as to be distinctly visible; but there was yet greater turgescence in those of the membranes of the brain, especially in the pia mater of the left hemisphere, on which also, there was a black stripe of extravasated blood. The right ventricle contained a considerable quantity of coagulated blood, which had flowed into it from a large cavity in the medullary substance, through the external side of the corpus striatum and of the thalamus nervi optici. A small quantity of blood had flowed from the right into the left ventricle. Previous to the dissection of this woman, Valsalva said to me, that if his observations did not deceive him, the principal lesion

would be found on the right side of the brain—a prognosis which the examination proved to have been correct.—*Morgagni*, iii. 16.

Case 13.

Apoplexy from extravasation into both hemispheres of the cerebrum, with flaccidity of structure.

A woman, forty years of age, much addicted to drinking, was seized with apoplexy in the middle of March 1740. She lost the use of both sides of the body, and was brought into the hospital at Padua, where she speedily died.

Dissection. The cavity of the cranium appeared narrow in proportion to its length; and the vessels of the pia mater were so greatly distended with blood that the small vessels presented the appearance of having been beautifully injected. The cerebrum and cerebellum were flaccid; bloody points and filaments were numerous throughout the medullary substance; and a cavity was found in each hemisphere: that in the right hemisphere was scarcely large enough to receive a small prune, and was filled with a brownish matter like glue or half dried mucus: the other cavity, however, was much larger in all its dimensions, especially the longitudinal, for it extended the whole length of the adjacent lateral ventricle and was full of blood, a small quantity of which had entered that ventricle, and descended from it to the third ventricle. There was an opaque spot in the coats of the basilary artery.

I could not ascertain whether the woman was affected with paralysis in both sides equally, at the onset; or whether she had previously been the

subject of apoplexy; from the appearance of the smaller cell I believed that she had.

Morgagni, iii. 6.

Many cases of apoplexy appear to maintain some analogy with cases of aneurism; and not unfrequently they exist together. In such instances, it is probable that the coats of the cerebral vessels become dilated, ulcerated, or otherwise diseased, before they rupture.—8.

It is not uncommon to find the coats of the vessels of the brain ossified, in old people—especially the carotids, where they make so great a flexure at the side of the sella tursica. In the case of an old woman, however, who died apoplectic from great extravasation; whilst almost all the other arteries, even the carotid, had bony lamellæ in their parietes, the coats of the cerebral arteries were in a natural state.—lxii. 7.

The cells remaining from previous attacks of apoplexy are often discovered. Brunnerus relates, that in the head of a woman who recovered from apoplexy, with which she had been attacked five years before death, he found the remains of three small cells round the corpus striatum, which had become callous and had cicatrized. In another case of hemiplegia of the left side, in which I was consulted, the man died ten months afterwards, of diseased heart. The right hemisphere of the brain contained an abscess four digits in breadth, and one and a half in depth. The thalamus of the optic nerve on that side was less by two thirds than the left. J. W. Albrechtus found a cavity in the brain of a person whose cranium had been depressed

thirty years before, sufficient to receive his finger; and as this could not have happened without a laceration of blood vessels, he maintained that the blood or pus must have been absorbed.—ii. 16.

Case 14.

Apoplexy from extravasation into the left hemisphere.

An old man died apoplectic in the hospital at Padua, about the beginning of December 1744. He had been seized thirty days before, and at length became senseless, and fell into a state of muscular immobility. His eyes were extremely red.

Dissection. The upper part of the right lobe of the lungs was indurated and contained a tubercle in a state of suppuration; the corpora sesamoidea in the semilunar valves of the aorta, were enlarged and of a white colour. Beneath the right hemisphere of the brain a small quantity of blood was extravasated, and the vessels of the pia mater were exceedingly turgid. Within the substance of the left hemisphere there was a cavity, the length of which was at least equal to the breadth of five fingers, and its width to that of two and a half; it contained a considerable quantity of blood, partly coagulated; the parietes of the cavity presented a lacerated appearance; the circumjacent parts of the brain, involving the corpus striatum and the thalamus nervi optici were very soft; the lateral ventricles contained a small quantity of bloody fluid.—*Morgagni*, lx. 2.

It is probable that extravasation to so great an extent had not taken place at once, but had been gradually increasing from the earliest period of the attack. Whenever apoplexy is threatened, it is

evident that the quantity of food should be diminished, blood should be withdrawn, and exertions of mind and body should be moderated.—3.

Case 15.

Apoplexy from extravasation into the ventricles, with degeneracy of structure in the brain, and disease of the heart and aorta.

A husbandman of middle age, and rather corpulent, was brought into the hospital in the beginning of the year 1748, in an apoplectic state. It was reported to be his third attack. His respiration was stertorous, and the whole body paralytic; he was destitute of sensibility, and incapable of motion; his pulse was extremely slender; and death occurred within about seven or eight hours.

Dissection. Four days elapsed before the dissection was performed. The vessels about the head were turgid with blood. As soon as the cranium was opened a considerable quantity of dark coloured blood flowed down; the vessels distributed through the pia mater of both the cerebrum and cerebellum, were extremely loaded, and a small quantity of blood was extravasated beneath this membrane in the middle of the left hemisphere. Into the ventricles a large quantity of blood was effused; for besides two or three ounces of coagula, fluid blood pervaded not only the lateral but also the third and fourth ventricles. The posterior surface of the left ventricle, and of the left thalamus of the optic nerve, discovered laceration; but an injury of this nature was more obvious in the right, where the thalamus was scarcely distinguishable, and no

trace of the corpus striatum could be found. The seat of this body was occupied by a substance, the colour of which was a mixture of red and yellow; it was in a state of suppuration, but had no offensiveness of odour. The cavity of both ventricles was dilated, and the septum lucidum was broken through; there was no vestige of the fornix, and scarcely any of the choroid plexuses. The coats of the left vertebral artery, before that vessel inosculates with the opposite to form the basilary artery, were somewhat thickened and opaque. Extravasated blood existed in the vertebral canal, beneath the pia mater.

The texture of the heart was extremely flaccid; the coronary vein was dilated; the parietes of the pulmonary artery and its valves were thin; the left auricle of the heart was expanded much beyond its usual capacity; the lower edge of one of the mitral valves was thickened to an extreme degree; bony concretions were formed upon the corpora sesamoidea of the semilunar valves; and in several places the aorta was ossified.—*Morgagni*, lx. 4.

The blood in this case appears to have been extravasated from rupture of the vessels in the choroid plexuses, or of other vessels within the ventricles; and the greater part had probably flowed from the right side.—5.

Case 16.

Apoplexy from extravasation into the cerebrum, with distortion of the spine.

A beggar, about fifty years of age, having a curved spine, was seized with apoplexy; his right limbs were paralytic, and his mouth was distorted. He was immediately received into the hospital, where

repeated bleedings and other measures were employed, by which he regained ability to speak a little. After the lapse of some days, he was seized with another paroxysm, from which again he was relieved; but was carried off by a third attack, which occurred nearly a month afterwards.

Dissection. The dura mater adhered very closely to the skull. The internal medullary structure of the left hemisphere of the cerebrum, contiguous to the lateral ventricle, contained about a spoonful of black and grumous blood.

The ligament which embraces the *processus dentoides* of the second vertebra, had united into one substance with that bony process.

Morgagni, lxii. 11.

It is probable that the tendency to sanguineous apoplexy was augmented in this case by the curvature of the spine, and the consequent inflection of the aorta, by which the blood would circulate through it less freely than when preserving its natural course; and it is equally likely that the hemorrhage was controlled, and the fatal consequences protracted, by the seasonable bleedings.—12.

Case 17.

Apoplexy from extravasation into the left ventricle and into the cerebellum, with diseased aorta.

A corpulent woman, eighty-five years of age, who, as far as I could learn, had always been a cripple, and who had borne twenty children, was seized with apoplexy in the summer of 1753. She was again attacked about the middle of January 1754. From both these paroxysms she speedily

recovered, without any paralysis; but ten days after the latter, she was again invaded by this formidable malady, and died fourteen hours afterwards. Each paroxysm had been preceded by vomiting.

Dissection. The trunks of the large vessels in the abdomen were unnaturally wide; the aorta and iliacs were ossified. The tubercle in one of the semilunar valves of the heart was nearly of a bony structure.

The vessels of the pia mater were distended. A large coagulum of blood, and a considerable quantity of bloody serum, were found in the left ventricle; but the source of the blood was not discoverable; the right ventricle contained some bloody serum. Within the right lobe of the cerebellum, a considerable lesion of structure was discovered which had been formed by extravasation of blood; the space was filled with blood in a state of coagulation.—*Morgagni*, lx. 6.

Case 18.

Apoplexy from rupture of the internal carotid artery.

A man twenty-two years of age, who, having heated himself by running, perspired greatly, and neglected to change his clothes, became insensible as soon as he arose from bed the following morning, and fell three times. Having been raised up, he complained of deep seated pain in the head, especially in the occiput; and fever, accompanied with a sense of lassitude and pain of the whole body, soon followed. He was purged, bled, and cupped, but daily became increasingly lethargic. On the eighth day he was suddenly seized with aphonia, and, for

an hour, lay motionless, as if in a state of apoplexy: the pain in the occiput was afterwards exasperated, and extended to the shoulders and spine in a most violent degree. On the ninth day he was again bled, and there appeared some remission of the symptoms, but the apoplectic paroxysm recurred, and proved fatal.

Dissection. Some grumous blood was found in the cranium, near the commencement of the spinal marrow, which had escaped from a laceration in the trunk of the internal carotid artery; the ventricles of the brain contained a large quantity of a saltish fluid; the lateral ventricles contained also a portion of coagulated blood. Throughout the crura of the medulla oblongata some pellucid little bodies, the size of millet seeds, were observed.

Valsalva, ii. 19.

It is rather surprising that death did not take place earlier, which has been the case in other instances when blood had been extravasated about similar parts. It is probable that the carotid artery was but slightly lacerated at first, and only a small quantity of blood escaped, but that it was afterwards discharged with greater freedom.

Morgagni, ii. 20.

Case 19.

Apoplexy from extravasation into the cerebellum, with softening of structure.

A sexagenarian, who obstinately persisted in the abuse of wine, notwithstanding he was often attacked with vertigo, was found dead soon after having eaten his dinner; his upper limbs were greatly contracted, and fæces had been voided

involuntarily. No indisposition had previously been manifest, but his face was unusually florid.

Dissection. There was a considerable quantity of limpid serum between the dura and pia mater; and the latter membrane which was of a rather pale colour, contained serum in the interstices of its vessels, which presented the illusive appearance of jelly. Some of the glands of the choroid plexuses were equal in size to large lentils, and two coagula of blood were attached to the right plexus. On both sides of the cerebellum there was extravasated blood—on the left side about the quantity of an ounce, and that portion of the cerebellum which was contiguous to it had a soft consistence, like rotten fruits.*—*Valsalva*, ii. 22.

The morbid appearance of the cerebellum should not induce a disbelief that laceration had suddenly taken place; for in other cases a similar appearance resulted from apparently recent extravasation; although there might have existed in the vessels a previous tendency to rupture.—23.

Case 20.

Apoplexy from extravasation beneath the cerebellum, with laxity of structure.

A youth fourteen years of age, having black hair, subject to worms, liable to epistaxis from slight exertion, or even from sitting near a fire,

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* Morgagni, in reference to this case, has very aptly quoted an admonitory sentence from Celsus. He says, "id nimirum est, quamobrem ii quibus hic aut alius a venarum, arteriarumve disruptione morbus imminet, *suspecta habere*, (ut Celsi verbis utar) *bona sua debent*."—*Ed.*

and addicted to the frequent abuse of spirituous liquors, experienced a sudden transition from vivacity to dulness, without an obvious cause. One morning, after he had met the family with his wonted cheerfulness, he was found extended on the bed: he vomited, frequently compressed his head, as if it were in great pain, was speechless, and soon lost all power of motion. From the loss of blood he appeared to recover a little, but speedily relapsed into his previous state of paralysis and lethargy. His pulse was small and intermittent, respiration was impeded, and he foamed at the mouth. These symptoms progressively increasing, he died the ensuing night.

Dissection. On the following day the body was inspected. When the integuments of the head were divided, an unusual quantity of dark and fluid blood escaped from the divided vessels. The lateral and third ventricles of the brain contained a small quantity of serum; the texture of the cerebellum was soft, and underneath it, nearly in the centre, about two spoonfuls of black and coagulated blood were extravasated.—*Morgagni*, iii. 24.

We shall now adduce examples of apoplexy from turgescence of vessels, without estravasation of blood.

Case 21.

Apoplexy from turgescence of vessels in the head, with disease of the heart.

Peter Fasolati, an engraver at Padua, in the sixty-second year of his age, and enjoying good health, had supped heartily, and had retired to

bed earlier than usual; two hours afterwards his wife found him not only dead but cold, and lying in the position in which he laid himself down to sleep. This happened on the day after the death of Tita, of whom some particulars have been related.

Dissection. The body was examined the next day. As soon as the scalp was divided, a considerable quantity of blood poured from its vessels. There was no appearance of extravasated blood within the cranium. The ventricles contained a small quantity of limpid fluid, but the substance of the cerebrum and of the cerebellum was perfectly natural. All the vessels, however, in the membranes and in the substance of the cerebrum were turgid with fluid blood to a degree that exceeded every thing of the kind which I had previously observed; some vessels scarcely discernible at other times, were greatly distended.

The pericardium contained a small quantity of bloody serum; the heart was large, and its vessels and auricles were distended with blood; the right valvula mitralis, and some of the semilunar valves, were opaque, and indurated; and on the centre of the posterior surface of the heart a small white membrane protruded, which appeared to be the vestige of a ruptured hydatid.—*Morgagni*, iii. 26.

This man being plethoric, and retiring to rest with a loaded stomach, would have the aorta compressed, and respiration would be impeded. By these means a large quantity of blood accumulated in the head, and proved fatal.—27.

Case 22.

Apoplexy from turgescence of vessels in the head, with disease of the aorta.

A man apparently about forty years of age having come from Milan to Padua on foot in January 1756, was received into the hospital rather on account of lassitude than fever. Whilst sitting there and taking food, he was suddenly attacked with apoplexy, to such a degree as to be totally deprived of sensibility, and of all power of motion. Although copiously bled, he died at the expiration of two hours.

Dissection. The heart was rather small, and its figure such as I had not observed in this organ before—the right side was greatly curved. The internal surface of the aorta, beyond the origin of the left subclavian artery, was rough to some extent, from an appearance of prominent fibres, as if there were deficiency of the internal coat.

The vessels of the pia mater were extremely distended with blood; as were those also which are distributed through the medullary substance of the brain; but no extravasation of blood could be discovered. There was a very small quantity of bloody serum in the lateral ventricles, and some hydatids of considerable size, in the choroid plexuses.—*Morgagni*, lx. 8.

Case 23.

Apoplexy from turgescence of vessels in the head, with disease of the aorta.

A woman, whose age coincided with that of the man in the preceding case, was brought into the

hospital a few days after him, where she died within two days. She manifested neither sense of feeling nor power of motion; and scarcely opened her eyes even when red-hot plates of iron were applied to the soles of her feet.

Dissection. In the trunk of the abdominal aorta there were some white spots, indicative of the process of ossification; in one of which this process had been completed.

The middle of the left fallopian tube adhered to the ovary; this ovary was smaller than the left, and contained some white globules, one of which, on being divided, appeared to consist of a compact substance, having a central cavity; the right did not contain either vesicles or globules, but its surface was tuberose, and not without appearances of cicatriculæ.

All the vessels within the cranium, even those of the plexus choroides, were turgid with blood; and there was a small quantity of water in the lateral ventricles; but besides these, no organic lesion was discoverable in the cerebrum, cerebellum, or medulla oblongata.—*Morgagni*, lx. 10.

Various experiments have been made on the degree of compression which the brain can endure; but there is a material difference between pressure applied to a small part of the brain, and that which is not only made upon the whole circumference, but is, at the same time, even applied internally throughout the cerebral structure.

Poupart presented a memoir to the royal academy of sciences at Paris, containing the history of a woman, one half of whose skull was deficient.

When the dura mater was slightly touched with the extremity of the finger, much uneasiness was occasioned, and a thousand little torches seemed to be immediately produced before the eyes: the woman at the same time screamed violently.—lx. 14.

Whatever tends to obstruct the circulation of blood through the aorta, occasions excessive determination of blood to the head. This has happened from curvature of the spine, and from tumours pressing upon the aorta. In a case of rupture of a lateral branch of the left carotid artery, from which the patient had been paralytic on the right side, the aorta was found to be compressed by an aneurismal tumour connected with the kidney.

Intense thought, especially in the recumbent position, is prejudicial to those who are liable to determination of blood to the head; but it has not unfrequently happened that the degree of health has been improved immediately before the apoplectic attack. A monk who had abstained from preaching for many days, on account of indisposition, on the day of his attack reported himself to be in perfect health. He ascended the pulpit with alacrity, and commenced that discourse which he was not permitted to complete.

Apoplexy has supervened upon the suppression of nasal hemorrhage by astringents; and a boy is reported by Slevogtius to have died apoplectic in the night after having had his hair violently pulled by an enraged schoolmaster. The scalp was detached from the periostium, and blood was largely extravasated on the dura mater: it was also effused

between the lobes of the cerebrum and into the ventricles.

The vessels within the cranium sometimes become greatly dilated. In a man who died from a fall, the right vertebral artery, within the cranium, was four times as wide as the left—the vessels of the dura mater in general were turgid with blood.*

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* It has of late been suggested that a more immediate relationship than had generally been supposed exists between apoplexy and active dilatation of the left ventricle of the heart; my own experience, however, has not corroborated this opinion. In common with others I have found the heart enlarged; and whenever it acts with impetuosity, as is not unfrequently the case under these circumstances, it cannot be questioned that the hazard of an apoplectic attack will be proportionately increased. Dr. Cheyne, in the Dublin Hospital Reports, has related a case of apoplexy in which the fleshy part of the heart was converted into fat.

Whatever tends to excite unnatural impetus of circulation; or to occasion undue determination of blood to the head, as appears to happen from protracted mental exercises, and from other affections of the nervous system, will have a tendency to induce a state of cerebral turgescence. Although not an advocate of the *exclusive* agency of the digestive organs in the production of disease, I believe that derangement in their functions will often occasion the state of the nervous system here alluded to. At first perhaps the affection of the head is scarcely perceptible—the mind is dejected—the temper irascible—the head at length begins to ache, and the arteries to throb—an unexpected though slight concussion of the body seems to shake and distress the encephalon—there is frequent vertigo—and unless the disease be counteracted, apoplexy will not be an improbable consequence. I have known several cases of this nature, which bleeding, though temporarily mitigating the disorder, and removing from time to time the imminently threatening symptoms, did not cure, or even permanently relieve. Occasional blood-letting will perhaps be necessary, but it must be combined with assiduous attention to

Serous Apoplexy.

The discovery of a small quantity of water within the skull should not induce an immediate conclusion that it was the cause of death. At the end of this section a case will be detailed which tends to shew that much fluid may sometimes be deposited in the head, without producing the apoplectic state. It will be observed in most of the cases, that the cerebral affection was complicated with other diseases.

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the secretions and excretions of the digestive organs, and to the quality and quantity of the ingesta. But it appears from the numerous dissections of Valsalva and Morgagni that apoplexy is liable to occur from various lesions of the cerebral organ itself, and in complication with, perhaps in a measure dependant upon, disease in every other organ. This I apprehend will be observed by all whose opportunities of morbid inspections are numerous. It falls, however, most frequently to the lot of old people, in whom the coats of the arteries are diseased. It has already been stated (vid. page 28) that out of twenty-three cases of apoplexy only three were in youths and four in *middle-aged* men. Morgagni entertained the opinion that the disease proved fatal most speedily in persons at a robust age; and in old people was most liable to degenerate into long continued palsy.

Subsequent dissections have verified the opinion of this anatomist that extravasation most frequently takes place in the corpora striata, the thalami nervorum opticorum, or the circumjacent parts of the brain; and in concurrence with him this has been ascribed to the peculiar disposition of the brain and the distribution of its vessels. Dr. Bricheteau has likewise minutely described the formation of a cyst in the substance of the brain, surrounding the coagulum of blood, and the consequent absorption of it by the vessels of the cyst.—*Ed.*

Case 1.

Apoplexy from deposition of serum, with urinary calculus.

Valerio Zani was a man of plethoric habit, of soft muscles, short and fleshy neck, and red face. His father was destroyed by apoplexy; and his uncle, at upwards of seventy, died of stone in the bladder. He was habituated to a sedentary life—to close literary application—and, like other noblemen, to a sumptuous plan of living. In his forty-second year he became afflicted with urinary calculi, and voided several. At the same period of life he had constant discharge of saliva of a saltish taste, by which his teeth were destroyed. Before the completion of his sixty-first year the salivary discharge ceased. He was occasionally distressed by pains in the head, with a sensation of weight. In the sixty-third year he had some pain after voiding his urine; and oppressive pain in his head ensued from mental affections, which were followed by depression of mind, with some imbecility of motion in the right side. At the approach of autumn his legs became œdematous; and a considerable quantity of serous fluid escaped from a small ulcer in the right leg. This fluid coagulated by heat, and resembled the white of an egg; he became drowsy, and at the approach of the winter solstice he was found speechless, and his right side was almost paralytic. After taking some drops of spiritus ammoniæ, he could again speak, and move his right side; in a quarter of an hour the aphonia returned, but he comprehended what was said to

him. He died on the fifth day of this kind of apoplectic affection.*

Dissection. The stomach was distended with gas; the kidneys were flaccid; the bladder contained an oval calculus as large as a pullet's egg, having a rough surface and a reddish colour. The lungs were redder than usual; the heart was large; and the blood was fluid.

The dura mater appeared corrugated, but under the pia mater, in the sulci of the brain, so limpid a fluid was deposited that the membrane resembled glass. There appeared to be a greater quantity of this fluid in the right hemisphere than in the left; and the lateral ventricles contained about two ounces of it. There was also a vesicle on the right plexus choroides as large as a filbert, and some smaller vesicles were discoverable on the left. The internal coat of the carotid and vertebral arteries exhibited some firm and opaque spots, most of which were of the nature of cartilage, but others approached that of bone.

The serous fluid in the head was not coagulable by heat or by sulphuric acid, as that was which had escaped from the leg.—*Valsalva*, iv. 2.

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* There does not appear in this case to have been that degree of mental and bodily insensibility, with stertorous breathing, which usually characterizes apoplexy, and this will be observed in some of the ensuing cases; but where there is nothing decidedly at variance with the preservation of Morgagni's opinion, I have thought it proper to retain his designations of disease. Had I considered it right to dispense with this feeling, I perhaps should have arranged some of these cases under paralysis, rather than under apoplexy.—*Ed.*

Case 2.

Apoplexy from deposition of serum, with flaccidity of the heart, and ossification of the aorta.

A lawyer at Bologna, about sixty years of age, whose countenance was florid, inclining to a leaden hue, had complained for a month, of pain or a sensation of weakness in the region of the stomach, by which his strength had been greatly diminished, so that, when taking exercise on foot, he was frequently compelled to rest. Early in March he suddenly fell—his body was peculiarly contorted—his face was livid—he groaned and foamed at the mouth—fæces were discharged involuntarily—he became motionless, and died in half an hour.

Dissection. Twenty-four hours after death the body was examined. Soon after his decease, the face became pale; but at this period many parts of the body were livid. Whilst removing the cerebrum from the cranium, a small quantity of serum escaped from it: the vessels were not very turgid, but at the sides of some of them the serum presented the appearance of a gelatinous concretion; the pia mater was easily detached; and the whole cerebrum was extremely flaccid and of a faint colour. In the lateral ventricles there was a little serum which had a saltish taste.

The lungs were black, as if they had been died with ink. The heart was flaccid; and the coats of the aorta, near the heart, contained some bony lamellæ.—*Valsalva*, iv. 4.

The heart, in this case, was evidently unequal to the propulsion of blood, especially in walking,

when it is required to act with additional celerity. Valsalva, I believe, did not open the abdomen, because he attributed to the flaccidity of the heart, the uneasiness referred by the patient to the stomach.—*Morgagni*, 5.

It will appear from the brief histories which follow, that the suddenness of death does not always depend upon the quantity of serum which has been effused.

Case 3.

Apoplexy from deposition of serum in fever.

A slender man, forty years of age, on the ninth day of an acute fever, became speechless. In his limbs he retained a slight degree of the sense of feeling, and of the power of motion: his face was not red. He died about the thirteenth day.

Dissection. The brain was in a natural state, except that serum was deposited betwixt it and the membranes; and that the ventricles were filled with a similar fluid.—*Valsalva*, iv. 6.

Case 4.

Apoplexy from deposition of serum, after ulcers in the legs.

A man sixty years of age, of a sallow complexion, had long been afflicted with ulcers in his legs. These, at length, being dried, he was seized with aphonia and lethargy, and died the succeeding day.

Dissection. Serum was found between the membranes of the cerebrum and of the spinal marrow; and also in the ventricles of the brain.

Valsalva, iv. 7.

Case 5.

Apoplexy from deposition of serum; the blood fluid after death.

A woman who had previously been deaf, lost all power of motion on the last day of December. The pulse was imperceptible; the whole body was cold, except the left side, which retained a little warmth, especially in the upper part. The state of respiration varied; sometimes it was quick, at others slow; the inspiration was generally accomplished with ease and celerity, whilst the expiration was slow and mournful. She lived three days.

Dissection. The ventricles of the brain contained serum of a somewhat thick consistence; and the blood throughout the body was in a fluid state.

Valsalva, iv. 8.

Case 6.

Apoplexy from deposition of serum; the brain flaccid, and the blood fluid.

A woman, fifty-seven years of age, was seized with rigor, immediately followed by heat and thirst, to which a sensation of general pain and debility succeeded. The febrile paroxysms recurred twice daily, and on the second day her pulse became unequally intermittent, but the intermission ceased on the third day. During this period a large quantity of urine was voided, which appeared of a natural quality; but as the disease advanced the quantity greatly diminished. On the fifth and sixth days the febrile paroxysm recurred three times, accompanied with much difficulty of respiration, with

headach, thirst, and parched tongue. She had comfortable sleep during the night of the sixth, and on the seventh day she experienced some amendment; the fever did not return; the pain in the head had nearly vanished, and the pulse was more natural; indeed she thought herself well: nevertheless the countenance presented rather a cadaverous aspect; she was thirsty, but ate her dinner with a good appetite, and conversed cheerfully. Soon afterwards she was found dead.

Dissection. The skin, especially of the back, was almost universally covered with purple spots. The stomach was contracted; and the vessels of the intestines and kidneys were somewhat turgid with blood. The spleen was flaccid, and the gall bladder contained but a small quantity of bile. The lungs were turgid, and of a red colour from congestion of blood; they were also variegated with black spots. The blood every where was extremely fluid.

When the head was detached from the spine, a quantity of serum escaped from it. We found a quantity of the same fluid beneath the pia mater, and in the ventricles of the brain. The cerebrum was somewhat flaccid.—*Valsalva*, iv. 9.

Morgagni regretted that at the time when this case occurred, it was not customary to administer peruvian bark in such fevers; because in a similar case of intermittent fever, accompanied with apoplectic paroxysms, he prevented their recurrence with that medicine.

Case 7.

Apoplexy from deposition of serum; the brain flaccid; the vertebral artery ossified; and the blood fluid.

A man, about seventy years of age, of pallid countenance, had dulness of hearing, and was occasionally attacked with vertigo and a disposition to syncope. He had likewise some tremor, which was attributed to his having been for many years accustomed to manipulations with quicksilver; and also a large scrotal hernia on the right side. He had been walking with a friend, apparently well and cheerful, but they had scarcely separated an hour and a half when he was found dead in the road.

Dissection. The body was inspected twenty-four hours after death. The upper limbs were rigid; the mouth was distorted by being drawn to the right side, and on this part there was an appearance of ecchymosis, but whether it arose from a contusion received at the time he fell, or merely from the blood having accumulated there after death, I could not determine, for the blood throughout the body was in a fluid state. The cerebrum was flaccid and discoloured; beneath the dura mater there was a considerable quantity of serum, and a smaller quantity in the ventricles; upon the choroid plexuses there were some turgid vesicles; and in the coats of the vertebral artery there were small laminæ, some of a tendinous, some of a cartilaginous, and others nearly of a bony structure.—*Valsalva*, iv. 11.

Case 8.

Apoplexy from deposition of serum and turgescence of vessels, with diseased liver.

Io. Baptista Anguissola, an excellent prelate, was a man of large stature, and of a somewhat ruddy complexion; and he was liable to affections of the urinary organs. In the middle of July 1707, when in his sixty-first year, an old ulcer of the leg having ceased to discharge, he was first seized with syncope when out in his boat; and afterwards, in his bedchamber, he suddenly fell down in an apoplectic fit. Although bled several times, and blistered, he never regained the power of speech or the motion of his right side. About the middle of August respiration became stertorous, and he died.

Dissection. Upon the convex surface of the liver there were striæ of a brownish red colour; the gall bladder contained three or four calculi. The tunics of the urinary bladder were thickened. On dividing the cranium a quantity of serous fluid poured from its cavity. When the dura mater was reflected, an appearance resembling transparent jelly, of an ash colour, presented itself in some places beneath the pia mater, and the vessels upon the surface of the cerebrum and cerebellum were a little more turgid with blood than usual; there was no unnatural appearance in the cerebral structure, unless perhaps it was somewhat flaccid; there was but little fluid in the ventricles.

Morgagni, iv. 13.

The turgid state of vessels in this and other cases which follow, enables us to rebut the doctrine

which has been inculcated, that bleeding is injurious in serous apoplexy.—14.

Case 9.

Apoplexy from deposition of serum and turgescence of vessels, with disease in the thoracic and abdominal viscera.

A young man at Venice, twenty-nine years of age, who was deformed and addicted to drinking, whilst pursuing his usual avocation of selling provisions about the city in October 1707, first staggered, then fell, and died. His face was livid, and the wine which he had drank, flowed from his mouth and nostrils with other bloody fluids.

Dissection. I examined the body, in company with the celebrated Santorini, on the following day. The arms were slightly rigid and contracted; the corpse had a foul and squalid appearance, and buboes in the groin had recently cicatrized. The liver was enlarged, indurated, and of a somewhat pale colour; the spleen also was enlarged, but flaccid. The pancreas was of an unnaturally firm structure. In consequence of a great degree of curvature in the spine, the viscera were displaced, and the thorax was so much contracted as to appear a very narrow cavity. The heart was rather large; the pleura pulmonalis and the pleura costalis adhered together by soft and slender membranes; the bronchiæ contained mucus, which in some places was a little bloody.

The calvarium was thick; the vessels within the cranium were turgid with blood, especially in the pia mater, on the right and inferior part of the

cerebrum; and a quantity of serous fluid was deposited within the convolutions throughout the cerebrum. The choroid plexuses were of a pale colour, and vesiculated. The texture of the whole brain, but especially that of the cerebrum, was exceedingly firm.—*Morgagni*, iv. 16.

Case 10.

Apoplexy from deposition of serum, and turgescence of vessels; the coats of the vessels diseased, with other organic lesions.

An ostler, nearly sixty years of age, tall and corpulent, accustomed to eat and drink in excess, was brought into the hospital at Padua in an apoplectic state, from which he recovered. A second time he was seized with this disease, and was found lying in a corner of the stable in a blanket in which three days before he had wrapped himself; he had less power in the right than in the left side, but he lifted that hand to his head, and attempted to speak: the disease, however, became more urgent, and he died ten hours after being discovered.

Dissection. During an attentive examination of the body, and its demonstration to the students for some days, the following unnatural appearances were observed. The stomach was extremely contracted, and upon the middle and external surface of it there was a roundish tubercle, of the same colour and texture as the coats of the viscus on which it was formed. The bladder was so distended as to reach to the umbilicus; the distension was continued to the kidneys, through the dilated ureters, and the right kidney was in a state of

ulceration: the right ureter was so dilated on coming out from the kidney as to equal a hen's egg; and the coats of the bladder were thickened.

The right lobe of the lungs adhered closely to the pleura costalis; the whole surface of the heart was united with the pericardium; its ventricles contained blood of a black colour, and which in its consistence resembled tar, more of which flowed from the inferior vena cava when it was divided; the carotid arteries were greatly dilated.

Although six days had elapsed before the brain was examined, the cerebrum was remarkably firm; and the cerebellum moderately so. A considerable quantity of serous fluid was effused not only between the membranes, but also in the ventricles of the brain. The vessels of the pia mater were more turgid than usual; there was a little fluid in the duplicature of the septum lucidum; and a considerable number of vesicles on the choroid plexuses. Both the posterior branches of the carotid arteries, which usually are minute, were exceedingly dilated: the coats of other vessels had become opaque, and contained small whitish protuberances, almost cartilaginous, some of which were rather like excrescences than in that state which precedes ossification.—*Morgagni*, iv. 19.

Case 11.

Apoplexy from deposition of serum and turgescence of vessels, with disease in the abdominal and thoracic viscera; the blood fluid.

A fishmonger at Venice, of middle age, of good habit of body and rather corpulent, had not

regained his wonted vivacity after an illness he had experienced some months before, when on the fourth of August 1708, without any evident cause, his left cheek swelled extremely, the tumour extending itself from thence under his chin and ear. On the second morning afterwards, having passed a comfortable night, he had but just risen from bed and was dressing himself, when he suddenly started from his seat, ran once or twice across the room, immediately sat down, and on being interrogated he only answered by a repeated expression of suffering, and expired.

Dissection. Before evening the body was examined by Santorini. The limbs were somewhat rigid; the internal parts of the abdomen, such as the omentum, mesentery, and also the mediastinum in the thorax, were fat; part of the small intestines, to the extent of a span, was of a variegated lividness; the spleen was larger and softer than natural, and had some broad opaque spots upon its surface; the substance of the liver greatly resisted the knife; its convex surface was of a dark red colour, and its edge was livid.

The lungs were turgid and heavy; the pericardium contained a small quantity of bloody serum.

The parotid gland was in a natural state, but the membranes which invested this and the adjacent parts, especially the cellular membrane, were distended with a serous fluid; at the posterior part of the pharynx it appeared as if blood had been extravasated; and other parts of the neck were spotted. In the membraneous textures at the root of the tongue, about the tonsils and the external

part of the pharynx, a considerable quantity of a thick and yellowish serum was deposited. The internal jugular veins were greatly loaded with blood.

There was considerable turgescence in the vessels on the surface of the cerebrum and cerebellum; serum was deposited beneath the pia mater; rather a large quantity of a similar fluid was contained in the ventricles; and some flowed out from the vertebral canal. In the choroid plexuses there were a few vesicles. No coagula of blood were observed throughout the dissection.—*Morgagni*, iv. 24.

Case 12.

Apoplexy from deposition of serum, with flaccidity of the brain and heart, and ulceration of the intestines.

A husbandman, forty years of age, under deep mental affliction from heavy misfortunes, was seized early in December 1705 with ardent fever. After some days the heat of the skin, and the dryness of the tongue were mitigated; but the pulse which had been soft and unequal from the beginning, beat with more inequality. On the 17th of the same month the arterial action was of a still more unfavourable description, and its strength diminished; the thirst continued, and the man's eyes became fixed. When particularly interrogated, he he said that his head felt a little heavy; and about half an hour afterwards, whilst attempting to drink some water, he suddenly expired.

Dissection. I opened the body on the following day. The abdomen contained more fluid than natural; and the omentum was so retracted as to lie in the left hypochondrium. The peritoneal coat

of the jejunum was sprinkled with petechiæ, the ilium was of a reddish colour, and in two places the coats were somewhat hard. One of these parts having been opened, exhibited an ulcer two digits wide and three in length, and this ulcer had destroyed the internal coat. The edge of the liver was black, the bile thick and turbid, the spleen large and flaccid, and the bladder distended with urine.

Each cavity of the thorax, and the pericardium, contained some bloody serum. The heart was of an extremely loose texture.

The brain was very soft; serum was deposited beneath the pia mater; and, in some places, there were bubbles of air under the same membrane. The ventricles contained a little bloody serum, and some vesicles filled with a pellucid fluid, were observed upon the choroid plexuses.

The jaws were very firmly closed, whilst the other parts of the body were scarcely at all rigid: the upper lip was drawn to one side at the period of death. When the mouth was opened, an abscess was discovered in it as large as a walnut: the posterior parts of the mouth were livid, and when their soft parietes were cut into, they exhibited numerous cells, distended with a fluid which presented a gelatinous appearance.—*Morgagni*, iv. 26.

With such flaccidity of the heart and brain it is not at all surprising that this man died suddenly. The morbid condition of the latter organ had been indicated by the stupor—by the insensibility to the stimulus of urine—to the pain arising from the ulcerated intestinum ilium—to that of the

abscess of the mouth—and to the affection of the membraneous tissues about the fauces and larynx. —27.

Case 13.

Apoplexy from deposition of serum, with diseased liver and spleen.

A countryman, upwards of sixty years of age, having long had ulcerated legs, the cure of which he strongly desired, an officious surgeon attempted to heal them, without due regard to the unhealthy condition of the man's body, and for six days his bowels were not evacuated. The ulcers had nearly cicatrized, when he suddenly felt some imbecility of the head; the pulse, at the same time, being small and exceedingly weak. The power of the arterial action had returned by the following morning, but on the third day he became delirious, and soon the sense of feeling throughout the body was annihilated; yet he could extend the arms when desired to do so, that his pulse might be felt. His respiration became stertorous, and he died.

Dissection. The abdominal muscles had a fine flesh-colour. By the side of the lumbar vertebræ the cellular substance was œdematous. The colon was occupied by hardened fæces, and the liver was somewhat enlarged. There were small spots upon it of a tawney hue, so that its surface was diversified like marble; and it exhaled an offensive odour. The gall bladder was contracted, and contained but little bile. The spleen was very large, and covered with black spots of an oblong figure, and the vesiculæ seminales coincided with

them in colour. Within each tunica vaginalis an hydatid existed, which was almost detached; and the fluid with which their vesicles were distended did not coagulate by heat, but after evaporation a thin pellicle was left in the vessel.

The pleuræ adhered together by extended portions of a thin membrane. When the cervical vertebræ were divided from the thoracic, a quantity of serous fluid distilled from the tube; and on the cranium being opened, a similar fluid was found between the dura and pia mater, and betwixt the pia mater and brain.—*Morgagni*, iv. 30.

Case 14.

Apoplexy from deposition of serum and turgescence of vessels, with discolouration of the medullary substance.

N. Ferrarinio, a priest of Verona, of rather slender make, forty-three years of age, who, ten years before, laboured under hemicrania at Padua, had sometimes too florid a face, and though apparently vivacious, he was anxious and irascible. He had been habituated to complain of pain beneath the sternum. In the same month of May in which Tita and so many others died suddenly, he had cheerfully eaten a moderate supper with his friends; but early the following morning he was found dead in bed, in a supine and sleeping posture. The arms were extremely rigid.

Dissection. Whilst opening the skull some blood flowed out of it. The dura mater, in the course of the sagittal suture, was black from blood; the vessels of the pia mater, on the surface of the brain,

and in the membrane of the lateral ventricles, were turgid with blood. The medullary substance of the brain was of a brown colour, a circumstance I might have attributed to the quantity of blood, if in other instances I had not seen a greater excess and more numerous vessels, whilst the medullary structure retained its natural whiteness. There was a considerable quantity of fluid in the ventricles, and in the vertebral canal. There was no obvious lesion in the cerebrum or cerebellum that related to the previous hemicrania. The root of the aorta was unequal externally, and internally was rugous, with slight appearances of ossification. I believe the disease in the aorta contributed to the production of apoplexy, and probably occasioned the pain beneath the sternum.—*Morgagni*, iv. 21.

There is naturally some moisture in the ventricles of the brain, but whenever *a little* is mentioned as having existed in an apoplectic person, I am persuaded there was a superfluity; and a very small portion deposited suddenly, or within a short period, may occasion dangerous compression of the brain.—i. 29.

It will be observed from the preceding histories that the progress of serous apoplexy varies under different circumstances. The nature of the effused fluid—the distension of vessels—the augmented power of the arteries—the diminished capacity of the cranium from any morbid cause, as the existence of tumours—and the degree of complication with disease in other organs, tend to produce this diversity.—32.

There are some anatomists who will not admit

that serous deposition is a cause of apoplexy; but who consider the accumulation of blood in the vessels ramifying upon the membranes and passing through the substance of the brain as the cause, and the effusion of serum, as the effect. In general, I believe, this is true; but those who have denied that a serous fluid is ever the cause of apoplexy, appear not sufficiently to have observed that extravasations of blood do not always arise from the rupture of distended vessels, nor, in all cases, from the present impetus of circulation, for the coats may be pierced by ulceration, or by the attenuation resulting from previous repeated distensions. It has been shown by the preceding cases that apoplexy may arise from vascular and extra-vascular compression. The effects of compression have been demonstrated within the human body and in brutes, when a considerable portion of the skull has been removed; for by pressing the brain with the hand, the same symptoms came on which attend apoplexy, and gradually vanished when this pressure was removed. It is farther elucidated by the operation of trepanning when blood is extravasated upon the meninges; by which operation, and the removal of the blood, instant death is sometimes averted.—33.

Consequences similar to those which arise from effusion of blood, may ensue from deposition of serum. It might indeed be the effect of retarded or obstructed circulation through the head; but the compression arising from this excessive secretion may be considered as the ultimate occasion of apoplexy—34.

Case 15.

Apoplexy from deposition of serum, and turgescence of vessels, with discolouration of the medullary substance.

This case is related on the authority of Nicholas Mediavia, who at that time, March 1740, was public demonstrator.

An old man, who had ulcerated legs, was suddenly attacked with pain in his head. Some apprehension of danger having arisen, he was immediately bled; nevertheless, twenty hours afterwards, he became apoplectic. At first the right limbs only were in a state of paralysis, but soon afterwards he ceased to have control over any of the lower parts of the body; and in a few days he died.

Dissection. The vessels at the basis of the cerebellum, and those passing over the corpus callosum were turgid with blood: there was a considerable quantity of serous fluid in the lateral ventricles, and the choroid plexuses were of a pale colour. The most remarkable circumstance, however, was that the whole medullary substance of the right hemisphere was of an exceedingly brown colour, but not the left.—*Morgagni*, v. 15.

A considerable quantity of serous fluid is sometimes deposited, as in cases of hydrocephalus, without producing apoplectic symptoms, one of which I shall adduce here as an example

Case 16.

Effusion of serum, without either apoplectic, or the usual hydrocephalic symptoms.

An old man, nearly an octogenarian, the surface of whose body was almost covered with filthy pustules,

was brought, at the beginning of the night, into St. Mary's hospital at Bologna. His pulse was not frequent, but weak and unequal; and not so perceptible in one arm as in the other. His eyes glistened and were fixed. When interrogated he denied having any pain in the head, or any disposition to somnolency; he vomited, and his tongue appeared to waver, yet the sense of feeling and the power of motion remained. During the night he gradually became worse, and died the following morning.

Dissection. The abdominal viscera were moister than usual; the liver was of a whitish colour and somewhat indurated; the gall-bladder contained a dark-coloured bile. The transverse arch of the colon was contracted to the thickness of a thumb. The lungs adhered universally to the costal pleura, and when detached on the left side some fluid escaped, but whence it came I did not with certainty discover. The blood was fluid in the heart and in every other part of the body. When the body was decapitated, serous fluid distilled from the foramen magnum; and after the cranium had been opened a similar fluid was found every where within the skull, especially beneath the pia mater, where, in some parts, bubbles of air were mixed with it. There were some vesicles on the choroid plexuses.—*Morgagni*, iv. 35.

Cerebral congestion after excessive loss of blood.

There may be determination of blood to the head, and great turgescence of vessels, even when the patient appeared to have died of hæmorrhage.

In a man whose death happened from the rupture of a popliteal aneurism and the consequent effusion of blood, numerous bloody points appeared in the sections of the medullary substance, and were enlarged to drops when I made lateral pressure on the sections. The corpora striata of this patient, when cut into small pieces, exhibited no striæ, but a continued medullary band.*—l. 55.

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* The importance of this observation is often verified in practice, and though, like the preceding, it does not relate to apoplexy, I have thought it might with propriety, be affixed to this sub-division of the present section. After uterine hæmorrhage, and also after copious depletion on account of pulmonary and other inflammations, I have frequently observed the symptoms of cerebral congestion—and which has generally appeared to arise from the excitement occasioned by some mental effort, though occasionally it has arisen without an evident cause. Whilst the other parts of the body appear comparatively bloodless, the vessels of the head throb violently; there is severe pain; confusion of intellect, sometimes to such a degree as to threaten delirium; the pulse at the wrist is usually small and vibrating, and the countenance distressed. When I first observed these symptoms I was led to abstract blood, from an apprehension of phrenitis; but I did harm: for if the urgency of symptoms was diminished, the susceptibility to a recurrence was increased, and restoration to health was protracted. The liability to this form of cerebral plethora has appeared to me to be proportionate to the preceding hæmorrhage, and the consequent debility. If in this condition an intrusive visitor be admitted to converse, though but for a short time, with the patient—or if the patient attempt to read, or in any other way to employ the mental faculties beyond what is perfectly easy—or if the mind be agitated, this state of the head will almost inevitably be induced. It may, however, be brought on by all those causes which tend to destroy the equilibrium of circulation; and none are more likely, in this condition of the patient, than noise in the room, deficiency of sleep, improper food, a constipated state of bowels, or a morbid state

Apoplexy from secretion of pus, and from bubbles of air in the brain.

By separating the cases of apoplexy into sanguineous and serous, it was not intended to divide the disease itself, but to distinguish the more common appearances on the dissection. Other causes of apoplectic symptoms, however, are not unfrequently discovered, some of which are subjoined.

CASE 1.

Apoplexy from an abscess in the cerebrum, and effusion of pus into the ventricles.

A man, thirty-three years of age, of a sanguineous temperament, and greatly addicted to the use of wine and tobacco, was seized with pain in the left side of his head, especially towards the occiput, which was followed by pain and imbecility of the cervical muscles on the corresponding side. At first there was violent fever, which afterwards subsided, and his pulse became not only slow but weak also, having little power of resistance; and his strength began to give way, so that he experienced

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of the secretions into them. This susceptibility to local congestion after excessive loss of blood, I presume depends upon the want of that due balance which, in a state of health, subsists between the nervous and vascular systems; but I am jealous of hypotheses in medicine, and to pursue them in the present work would be unwarrantable.

Drs. Sanders and Seeds bled animals to death by puncturing arteries and veins. When this was effected by opening a large artery, the brain was almost destitute of blood; but when death was occasioned by opening a vein, a state of venous congestion was found to exist.—*Ed.*

difficulty in moving himself. After interrupted delirium, he lost his voice; and total inability to move himself supervened. He progressively sunk, and died on the fourteenth day.

Dissection. Whilst removing the cerebrum from the cranium a small quantity of pus was observed at its basis, which had flowed thither from the ventricles, both of which, (but especially the right,) contained a large quantity of the same purulent fluid. In the right corpus striatum there was a foramen which communicated with an abscess that occupied a third part of the cerebral substance on that side.—*Valsalva*, v. 2.

It is probable that the fever was concomitant with the formation of the abscess, and that the remission of febrile symptoms happened, as usual, when the suppurative process was completed. When pus made its way through the corpus striatum, and was effused into the ventricles, it may be conjectured that the apoplectic symptoms commenced.—*Morgagni*, 3.

Case 2.

Apoplexy from pus in the ventricles.

A woman, upwards of forty years of age, whose menstrual discharges had greatly decreased, had a cancerous tumour arise on the left leg, which, after some time, ulcerated, was very painful, and was accompanied with febrile symptoms. The leg was amputated. Though every thing was favorable to the operation, the stump, at the expiration of three days, had a livid hue, which continued for two days, but profuse perspiration coming on, the

fever and swelling of the gland subsided, and every thing appeared to proceed satisfactorily. At the expiration of three months the stump had nearly cicatrized, when the patient was seized with an affection of an apoplectic nature. With a diminution of the sense of feeling and the power of motion in the whole right side of the body, delirium and convulsions were united; and although these symptoms abated for some days, they afterwards recurred with augmented violence, and carried off the patient.

Dissection. A large quantity of pus was contained in the left ventricle of the brain, but no lesion was discoverable in its structure.*

Valsalva, v. 4.

Case 3.

Apoplexy from abscess in the brain, and effusion of serum, with disease in the thoracic and abdominal viscera; also supernumerary ribs.

A woman of Padua, the wife of Angelo Zanardi, fifty-nine years of age, was seized with apoplexy, to which violent febrile symptoms were united. Though unable to speak, yet on the first day she appeared to comprehend what was said to her. She had neither sensibility nor power of motion in the right limbs, but they were somewhat contracted by spasm; the right eyelids were paralytic, and the face was florid. She could sup fluid aliment without difficulty.

Dissection. The nutrition of the body had been

* Valsalva was disposed to ascribe the deposition of pus in the brain to its translation thither from the leg. It would be needless in the present day to attempt the refutation of such an opinion.—*Ed.*

very unequal, for the trunk and thighs were fat, whilst the feet and legs, and particularly the upper limbs, were exceedingly slender. Thirteen hours had elapsed since death, and the season was very cold, being near the close of the year 1740, yet the abdominal viscera retained a considerable degree of warmth. The omentum was drawn up to the stomach; the stomach was small, but the intestines were inflated. The bladder was so distended as to ascend six digits above the pubis; the internal coat of this viscus exhibited, here and there, some bloody points; the vessels about the upper orifice of the urethra were so turgid that this canal appeared to have been inflamed, and was almost in a state of sphacelation. The gall-bladder was distended with bile, and contained several small and soft calculi, and one which was hard and granulated.

There were other unusual appearances, not the result of disease, but of malformation. The diaphragm was perforated by two foramina instead of one, by which veins were transmitted from the abdomen into the thorax; they were contiguous to each other, but quite distinct; through one of them the vena cava passed, and by the other one of the hepatic veins, which united with the cava a little above the diaphragm. There were twenty-six ribs, but the thirteenth on each side was so exceedingly small as scarcely to exceed two inches in length. There was also an additional vertebra, which might be associated either with the lumbar or dorsal, according as they were calculated.

A considerable quantity of serous fluid escaped from the cavity of the cranium whilst we were sawing through the skull. The dura mater was thickened; the vessels of the pia mater were greatly distended with blood; and beneath this membrane a transparent fluid was observed in the convolutions of the brain; the lateral ventricles contained a similar fluid; and the choroid plexuses were vesiculated—one of the vesicles being nearly as large as a small grape. When the choroid plexus was raised up, the left thalamus nervi optici was observed to be of an unusually brown colour; the circumjacent medullary substance was soft, indeed almost liquified, and commixed with a bloody fluid, to an extent exceeding that of the largest sized walnut. The structure of the cerebrum in general was extremely firm.—*Morgagni*, v. 6.

The cerebral lesion, in this instance, happened about that part in which my observations lead me to believe that organic diseases most frequently occur.

We are reminded by the inflammation and distension of the bladder of the great importance of protecting apoplectic patients from an accession of new diseases, arising from retention of urine—a circumstance very liable to happen in protracted cases. Nor are we to be satisfied by a stillicidium urinæ, for this may continue through weakness of the sphincter, whilst the bladder remains greatly distended; and the wetted bedclothes will have a tendency to mislead the attendants. It is incumbent on physicians, therefore, to examine the lower region of the abdomen occasionally, so that if there

be fulness of the bladder the urine might be drawn off.—7, 8.

I have occasionally seen other instances, in which the diaphragm was perforated by more foramina than usual; and there are a few instances on record, in which, as in this instance, there were supernumerary ribs. It occurred to me once to find only eleven on each side; and on another occasion there were eleven on one side, and twelve on the other, the first and second being united into one bone, having two heads.—9, 10.

Case 4.

Apoplexy from pus in the pia mater, and deposition of serum.

A tailor, addicted to excessive drinking, was seized with aphonia, towards the close of March, 1708, and died within two days.

Dissection. The abdominal viscera were in a natural state. The left cavity of the thorax contained a small quantity of bloody serum; the lungs were heavy, and when pressed were found to be pervaded by frothy mucus, but their texture was uninjured. The heart was flaccid. The aorta, the carotid arteries, and the pulmonary artery, were occupied by a large portion of fluid blood. When the body was decapitated an abundance of serous fluid escaped from the vertebral canal; and on the cranium being opened a large excess of a similar fluid was discovered beneath the pia mater. We were most surprised, however, to find a purulent deposition over the whole surface of the anterior lobes of the cerebrum, and that pus

existed even within the tissue of the pia mater. This membrane could be drawn from the cerebral surface with the greatest facility. So far as we were able to ascertain, the superfice of the brain was uninjured; but the substance of the cerebrum, cerebellum, and nerves, had the greatest possible degree of flaccidity. All the vessels, even the most slender, and those most deeply seated, as well as the sinuses, were turgid with blood. There was a little serous fluid in the lateral ventricles, and the choroid plexuses were of a pale colour.—*Morgagni*, v. 11.

Case 5.

Apoplexy from air in the vessels of the brain, and deposition of serum.

An Ethiopian at Venice, thirty years of age, died suddenly in the middle of July 1708. He was strong and healthy, except that during his last few months he experienced a sensation of imbecility in the region of the stomach. On the morning when the fatal catastrophe happened he was very cheerful with his friends at breakfast, and stood to play on the trumpet, when, falling slowly backwards, the whole trunk of the body trembling, he died at the moment of his fall.

Dissection. The body was inspected about twelve hours after death, and Sanctorini requested me to be present. The upper limbs were somewhat rigid, and the neck, from blood having subsided there, was of a darker colour than the other parts of the body. The eyes were unaltered.

The edge of the liver was almost black; and the

coats of the spleen opaque, and, in a particular spot, they were nearly of a tendinous structure. Numerous knotted and distended chyliferous vessels were observed in the mesentery, and the glands were enlarged. The cartilages of the ribs, for the man's age, were remarkably hard. A little more than the natural quantity of serous fluid was contained in the cavities of the thorax, and in the pericardium. The vessels on the surface of the heart, and in the whole of the thoracic viscera, were unusually conspicuous.

A serous fluid was deposited beneath the pia mater and in the lateral ventricles of the brain, but the larger quantity was in the left ventricle. There was rather a deficiency of blood in the sinuses; but wherever blood was found throughout the body, it was in a fluid state. The vessels which passed over the corpus callosum, those upon the upper surface of the brain, and the basilary artery, were distended with air; but no bubbles were discovered in other vessels except those of the brain.

Morgagni, v. 17.

Case 6.

Apoplexy from air in the vessels of the brain; existing also in other vessels of the body.

A fisherman of Venice, upwards of forty years of age, and the subject of dyspepsia, was seized, when in his boat, with an affection of the abdomen, apparently from flatulence, to which he had been previously liable, and suddenly expired. This happened a little before the middle of October 1707. The body was inspected on the following day.

Dissection. The abdomen was tumid from gas, with which the stomach and intestines were inflated. The veins which flow into the gastro-epiploic were so extremely turgid as to redden the coats of the former viscus, and the trunk of the gastro-epiploicæ, which in this body was single, was so dilated and tumid as to equal the size of my forefinger, but immediately on being cut into, it contracted; for it contained a large quantity of air, with a little frothy blood of a black colour. Some parts of the convex surface of the liver were of a dark colour; the gall bladder contained bile that was nearly black, and in this bile there was a calculus which, in its magnitude, colour, and granulated surface, resembled a mulberry: when held over burning wax it did not inflame. The spleen was large but not lax in its texture; the pancreas was somewhat indurated, and the abdominal cavity contained some bloody fluid. The small intestines, to the extent of a span, were red, and for the space of three digits (a portion which was incarcerated in a hernial sac) they had a gangrenous appearance, though the coats were firm.

The pericardium and heart were so closely united together that they could not be dissevered without laceration. The heart was large and flaccid; and both of the ventricles, and the right auricle, contained frothy blood. In every part which we inspected, all the veins were distended with black and frothy blood, and a portion was found in the aorta and in the carotid arteries. The trunk of the pulmonary artery was exceedingly turgid with this mixture of blood and gas. The lungs were in a

healthy state, but the internal surface of the trachea was stained with a dirty looking humour, the colour of which might be compared with that of tobacco; the mucous membrane of this canal, but more particularly of the larynx, was black and gangrenous; and in this state of disease the contiguous structures were implicated. Whilst examining these parts, thin pus flowed into the pharynx from the rupture of an abscess at the posterior foramina of the nostrils.

The sinuses of the brain were excessively turgid with frothy blood, as well as the vessels of the dura mater and of the pia mater surrounding the cerebrum and cerebellum, and in that process of the latter membrane which lines the ventricles. In the substance of the cerebrum and cerebellum there were more bloody points than I had seen before—they were diffused over every part. A small quantity of serum was deposited betwixt the membranes, and a larger quantity beneath the pia mater, and into the ventricles of the brain. The choroid plexuses were red and vesiculated. The scrotum was greatly inflated with air.

Morgagni, v. 19.

Cases similar to this occurred to Valsalva and Verdriesius.

Experiments have been made on animals by Wepfer and other physiologists, to ascertain the effects of air injected into the veins. If very little was thrown in, they were temporarily distressed, but did not die; but death has been produced in various animals, even in the ox, by inflating the jugular vein. The death of the animal was

sometimes preceded by slight convulsions, or by opisthotonos. The heart was generally found distended with air, and death seemed to have arisen from the functions of this organ being obstructed. Had I found the heart of the fisherman distended, I should have believed that he died from a similar cause: but as the vessels in no part of the body were equally turgid with those of the cerebrum and cerebellum, it does not seem unreasonable to attribute the apoplexy and death to obstruction of the circulation through the brain, and the compression arising from it.*—*Morgagni*, v. 24.

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* The connection between active aneurism of the left ventricle of the heart and apoplexy, has been adverted to in a former note; but perhaps I have not administered justice to the researches of M. Bricheteau of Paris, who within two years collected a large body of evidence on this subject at the Hotel Dieu, and of which he has detailed thirteen cases; nor have I perhaps been equitable to Dr. Johnson, one of our own distinguished medical writers, whose own observation has tended to sanction the opinions of Dr. B. respecting the frequency of this correspondence. Other states of cardiac aneurism, and other forms of disease in this organ, by which its functions or pulmonary circulation may be impeded, will conduce to a loaded state of vessels in the head.

Persons have sometimes been reported to die under the symptoms of apoplexy, in whose brain after death no morbid appearances could be detected; nevertheless the cause of death has been referred to some inappreciable lesion of the encephalon. This opinion has been adopted by some pathologists whose accuracy of investigation cannot be questioned; but it must be a very rare occurrence, and perhaps in some of these cases the fatal instrument existed in the medulla spinalis, the heart, or some part of the vascular system. It is impossible to adduce all the sources of this disease. I shall only add to those which have been stated, insolation, ungoverned passion, and narcotic drugs.

We may infer, from a large proportion of the preceding cases,

SECTION VI.

Paralysis.

Paralysis usually arises from the same causes that produce apoplexy, operating in a mitigated degree. It generally is the sequel of that formidable disease; but occasionally it occurs without having been preceded by that somnolency which constitutes an essential part of the apoplectic malady; and sometimes it originates from intestinal irritation. Each of these sources will be elucidated in the following cases.

Case 1.

Paralysis from an apoplectic cell beneath the left ventricle.

A man, seventy years of age, addicted to great excess in diet, having long before been attacked with

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that the disgusting and degrading vice of excessive drinking is one which very generally inflicts its own punishment. The deplorable consequences of habitual inebriation usually develop themselves by slow degrees, but it is not unfrequent for an apoplectic fit to occur during the excitement and plethora of debauch. Though a habit of excessive indulgence in eating is not equally disgraceful and humiliating in its immediate effects with that of the intemperate use of spirituous or fermented liquors, it is one which tends with almost equal certainty, to impair the functions both of mind and body, and to induce a series of irremediable organic lesions. The medical practitioner who is actuated (as I firmly believe most in the profession are) by sentiments of humanity, will often feel himself called upon closely to investigate the conduct of his patient in relation to these and other branches of his domestic conduct, and will kindly warn him of the issue. He will then have the unspeakable satisfaction of having done his duty—but his pleasure will often be lessened by the discovery that his friendly and disinterested caution was unheeded.—*Ed.*

apoplexy, was left, when the apoplectic symptoms subsided, with his right side in a state of paralysis, and the left was frequently affected with convulsive motions. His mental faculties were impaired; and he sometimes voided calculi with his urine.

Dissection. The omentum was so retracted that it concealed the whole anterior part of the stomach; the liver was morbidly adherent to the diaphragm; the stomach was corrugated, but when extended it was found to be unusually capacious; and the spleen was of double its natural size. There were four calculi in the left kidney, one of which was as large as a chestnut.

The thorax was not opened. A quantity of serous fluid was deposited betwixt the dura and pia mater. Attached to the left plexus choroides was a body the size of a horsebean, constituted of numerous hydatids; and beneath the correspondent ventricle there was a sinus, the parietes of which consisted of a yellow and flaccid cerebral substance, which appeared to be in a state of suppuration.—*Valsalva*, xi. 6.

The convulsions probably arose from the serum betwixt the membranes, and would in all probability have affected the right side as well as the left, if that side had not previously been paralyzed. The cause of the paralysis was seated beneath the lateral ventricle—beneath the corpus striatum and its adjacent parts.—*Morgagni*, 7.

Case 2.

Paralysis after apoplexy from deposition of serum, with flaccidity of the heart.

On one occasion there was admitted into the hospital of incurables at Bologna, an aged man, who, after apoplexy, was affected with hemiplegia of the whole right side of his body, and who was deprived of the sense of feeling as well as of the power of motion. He was afterwards attacked with fever and difficulty of breathing, though he neither perceived weight nor pain in the thorax. During the few last days of his life his pulse was weak, and the penis became gangrenous.

Dissection. The intestines were turgid with gas. The left cavity of the thorax contained a small quantity of serous fluid, and the upper part of the right lobe of the lungs was of a purple colour, and of a hard and compact texture. I had not on any former occasion found the heart so flaccid as it was in this instance—when laid down it fell so flat as scarcely to equal a finger in thickness; and indeed all the muscles were exceedingly relaxed.

As we cut into the cranium, a serous fluid escaped from it in no inconsiderable quantity, but some remained at the basis of the skull, in the spinal canal, and in the lateral ventricles: I supposed the larger quantity had been under the pia mater. On the left choroid plexus there were some vesicles turgid with fluid.—*Morgagni*, xi. 13.

Case 3.

Paralysis from ulceration of the brain; the left corpus striatum detached.

A sexagenarian, harrassed with diarrhæa, accompanied with tormina, and constant watchfulness, was seized in the following night with hemiplegia of the right side, without any previous complaint of the head. The first day, however, after bleeding, and the use of irritating applications to the soles of the feet, he could move his hand and foot a little; but the day afterwards he had not the least control over them. His right eye was half closed; his cheeks were florid; he could scarcely articulate—when he did speak it was with stammering. He gave sufficient evidence by signs that his mental faculties were unimpaired. At the commencement of the attack he respired with freedom, but respiration became difficult a day or two before death, which happened at the beginning of the fourth day.

Dissection. As soon as the cerebrum was removed from the cranium, but especially when the infundibulum was divided from the pituitary gland, limpid serum and fluid blood burst forth. On the left side a quantity of serous fluid was deposited along the course of the vessels which presented the appearance of jelly. In two places beneath the pia mater the substance of the cerebrum appeared to be in a state of ulceration, but this was more manifest in the corresponding ventricle, for here the corpus striatum was found to be entirely separated from the rest of the cerebral substance by the ulcerative process.—*Valsalva*, xi. 2.

Whatever was the cause of disease in this instance, it is certain that hemiplegia often results from lesion of the corpora striata, or the parts in their vicinity.—*Morgagni*, 3.

Case 4.

Paralysis from deposition of serum, and disease in the left corpus striatum, with flaccidity of the heart.

A husbandman, apparently forty years of age, was a patient in the hospital at Bologna. He complained of an unfixed pain in the thorax, accompanied with a sensation of pricking. He was afterwards affected with paralysis of the tongue, and of the right limbs. He scarcely knew any one, or understood what was said to him—his pulse was full and frequent, but equal; his respiration, except on the approach of death, was undisturbed.

Dissection. The spleen was greatly enlarged, but the rest of the abdominal viscera appeared to be in a natural state. Each cavity of the thorax contained a small quantity of bloody fluid, and the posterior surface of the lungs adhered to the costal pleura; but although of a red colour, both internally and externally, they were not indurated. The pericardium contained a little turbid and bloody serum, and the structure of the heart, as well as that of the other muscles, was greatly relaxed.

Serous fluid was deposited between the membranes of the brain, and burst forth as soon as the cerebrum was removed from the skull. The smaller vessels distributed through the upper part of the pia mater were turgid with blood, and the substance of the cerebrum was soft. The nates and

testes, and the pineal gland, were of a yellowish colour. The lateral ventricles contained fluid like that found in the pericardium, except that it was not thick; the surface of each ventricle was less smooth than usual, and in the left there was a more obvious diseased appearance. The medullary tract between the thalamus of the optic nerve, and the corpus striatum, was of a yellow colour, and almost liquified; and this corpus itself, when compared with the opposite, was much reduced in size, and wrinkled, as if there had been tabes of its substance. From the middle of it a tubercle projected, which in magnitude and figure resembled a large bean, and was of a red colour like a recent bruise on the skin. The remaining substance of the corpus striatum was yellow and so relaxed as to be nearly fluid.—*Morgagni*, xi. 11.

Case 5.

Paralysis from deposition of serum in the ventricles, and ulceration of the left ventricle.

A man, about sixty years of age, fell suddenly, having lost the power of motion and the sense of feeling in the right side of his body. He scarcely replied when he was interrogated, and when he did speak, it was with a stammering tongue. During the whole time he survived this attack he voided but little urine, and never evacuated the bowels without enemata.

At the commencement of the twenty-first day he had difficulty of respiration, which was the precursor of death.

Dissection. When the thorax was opened the posterior part of the lungs appeared as if it had been the seat of phlegmonic inflammation.* Between the dura and pia mater, and in the right ventricle of the brain a quantity of limpid serum was effused; but the fluid in the left was tinged of an eruginous colour; and in the floor of this ventricle there was an ulcerated cavity.—*Valsalva*, xi. 4.

Case 6.

Paralysis from deposition of serum, and a scirrhous state of the cerebellum.

A man about forty-eight years of age, accustomed to exposure to charcoal fires more than his occupation as a cook really demanded, and near which he stood with his head exposed, began to suffer acute pain in the head about a year before his death. His lower limbs were affected with such debility that he was unable to sustain his own weight. These circumstances continuing, united with some fever, he was compelled to lie in bed, and at length to seek medical advice. By the abstraction of blood the fever was subdued, but the other symptoms continued. He was confined to his bed at home during four months, and then came into the hospital. His pulse was tense and vibrating; and the lower extremities, as far as related to muscular action, were paralytic. He

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* This appearance is mentioned in many other cases, but I apprehend it arose merely from the subsidence of fluid blood, owing to the position of the body after death.—*Ed.*

was slightly delirious in the night; and slept during the greater part of the day; but at times his intellectual faculties were vigorous. He died within the tenth night.

Dissection. Whilst dividing the head from the trunk, and sawing off the calvarium, a serous fluid escaped. The vessels distributed through the membranes of the brain, and upon the surface of the lateral ventricles as well as through the medullary substance of the cerebrum, were unnaturally turgid with blood. Both hemispheres of the cerebrum were indurated; the corpus callosum was soft; the fornix and its pillars were still softer—indeed almost liquescent. The left corpus striatum was softer than the right, but the septum lucidum was firm in its texture. The ventricles contained a great quantity of limpid water; and even the pineal gland was distended with a similar fluid. The cerebellum presented a natural appearance externally; but when the scalpel had descended into it, the structure was found to offer unusual resistance. Instead of the usual appearance of the arbor vitæ, there were parallel medullary striæ amongst the cineritious substance. When the central portion of the cerebellum was divided, I found it was neither soft, nor of two colours, nor intersected with sulci; but was converted into a scirrhous texture, nearly of a pale flesh colour, consisting of what appeared like roundish bodies impacted together, exhibiting neither membrane, vessels, nor interstice. The disease extended a little towards the right side, but it occupied nearly the whole of the left lobe. In the right lobe the cortical and

medullary structures could be distinguished, but they were not distributed as they usually are.*

Morgagni, lxii. 15.

Case 7.

Paralysis from deposition of serum in the brain and spinal canal.

An old woman, who, though retaining the sense of feeling, had laboured under hemiplegia, as a sequel of apoplexy, for three years, was received into the hospital of incurables at Bologna, eight days previous to death. A few days after her reception she was seized with a violent pain, first in the paralytic shoulder and afterwards in the tongue. These symptoms were succeeded by aphonia, and life progressively became extinct without any increase of the paralysis.

Dissection. The examination only extended to the head and neck. A small artery, proceeding to the thyroid gland, was diseased, and its caliber diminished, by the deposition of a yellowish matter between its coats, of a consistence that would nearly allow of its being crumbled; and the gland

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* Paralysis has resulted from scirrhous tumours being developed in the brain. M. Hebreard, a few years ago, published an instance of this nature. The cerebrum and cerebellum were dense, especially at the origin of the spinal marrow. At the fissura sylvii arose an encysted tumour the size and form of a hen's egg. It was of a homogeneous brownish aspect, and of lardy consistence. The man was sixty-three years of age, and paralysis had insensibly come upon him. He spoke with difficulty; his limbs were affected; but the digestive functions and the mental faculties were unimpaired.—*Ed.*

itself was diseased. One of the parotid glands contained small fragments of calcarious matter. When the head was detached from the trunk it was supposed that as much serous fluid escaped from within the cranium, and from the vertebral canal, as would have filled a common wine bottle. On this account there was but little fluid discovered about the cerebrum or in the ventricles when the cranium was opened; and there was nothing else worthy of observation.

A large quantity of fluid is often met with in the vertebral canal of persons who had been hemiplegic; but it is somewhat astonishing that so large a quantity should have accumulated in the head as well as in the spinal tube without inducing apoplexy.—*Morgagni*, xi. 15.

Case 8.

Paralysis from turgescence of vessels, and softness of texture in the brain.

A woman, after a second attack of apoplexy, manifested a degree of stupor, and was nearly paralytic; one or two months afterwards she was attacked with fever, which was indicated by thirst, and the state of pulse. She died.

Dissection. The vessels of the cerebrum were somewhat turgid with blood of a black colour; and there was so much laxity in the texture of the cerebrum itself that in some places, the cortical substance adhering to the pia mater, was drawn off as the dura mater was reflected. A small quantity of serum was contained in the third ventricle.

The stupor and semi-paralysis may be ascribed to the softened condition of the cerebrum.*

Morgagni, xi, 22.

Case 9.

Paralysis from disease in the corresponding side of the cerebrum.

In general when paralysis arises from a morbid condition of the brain the lesion is discovered on the opposite side: this, however, does not invariably happen.

An old woman, the mother of a numerous family, having undergone apoplexy, was left with paralysis in the upper and lower limb of the right side, when the symptoms characteristic of the preceding disease had subsided. She could move them very slightly, but retained the sense of feeling. At the expiration of three months, drowsiness accompanied with considerable hesitation of speech, supervened. She was brought into the hospital, where life gradually became extinct.

Dissection. The uterus was so remarkably small that its length, from the external part of the mouth of that organ to the upper part of the fundus, was scarcely equal to the breadth of two fingers; it was proportionately contracted in its other dimensions, and its substance did not present a healthy appearance, but was of a livid colour. One of its tubes was not only impervious but adherent to the ovarium: the ovary was comparatively hard, and had a sort of chequered surface.

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* Observations on flaccidity of the brain are subjoined to the section on insanity.— *Ed.*

The scalp presented an extensive appearance of ecchymosis, though she did not appear to have had any contusion. There was no obvious disease in the left hemisphere of the brain; but the vessels of the pia mater on the right side were turgid with blood, and a small quantity of fluid was deposited beneath this membrane having some bubbles of air mixed with it. At the vertex to the extent of three or four finger-breadths, the cortical and medullary substances were of a pale brownish colour, and almost liquified. This lesion descended about the space of a digit into the cerebral substance.

Morgagni, lvii. 14.

Case 10.

Paralysis of the tongue from worms.

A young man, annoyed by intestinal worms, was subject to paralysis of the tongue. It disappeared in a few days, but recurred every month, accompanied with tormina.

I would explain this case by supposing the existence of sympathy between the intestines and the theca of the nerves of the tongue. *

Morgagni, xi. 18.

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* It cannot be doubted that partial paralysis may arise from intestinal irritation, whether that irritation be occasioned by worms, or by a disordered state of function in these organs from other causes. Several instances of this nature have fallen beneath my own observation. The more remarkable part of this case was its return at a somewhat regular period, but in this respect it is not unique: other cases of periodical paralysis may be cited.

That accurate observer of pathological phenomena, John Hunter, states that he was particularly attentive, for many years,

SECTION VII.

Epilepsy.

In the following cases Epilepsy will be found to have resulted from primary disease in the brain,

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to the form of paralysis which constitutes hemiplegia; and that he always found an injury done to the brain in consequence of extravasation of blood. "I have examined them," says he, "at "all stages; when it was recent,—some of weeks standing,— "others of months,—and a few of years,—in which I saw the "progress of reparation." In a case alluded to by Morgagni (vide page 38) this process of recovery had been completed.

Drs. Bricheteau, Rochoux, and Riobé have elucidated this restorative process by describing the formation of a peculiar membrane in the substance of the brain surrounding the coagulum. From this membrane it is supposed that a serous fluid is secreted which dissolves the clotted blood, and that paralyses occasioned by sanguineous effusions, gradually disappear in proportion as the fluid is absorbed.

Dr. Serres has recently published three cases in which the progress of restoration from extravasation into the substance of the brain by cicatrization was strongly marked. In the first the man died six weeks after the attack of apoplexy. The blood had been effused into the cerebral substance near the optic thalamus and corpus striatum, and the cavity formed by it was nearly obliterated. Complete reunion had taken place to the extent of an inch and a half; cellular meshes proceeded from side to side; and its internal parietes exhibited numerous granulations resembling those commonly designated fleshy vegetations: and from these circumstances he inferred that nature had proceeded as in the solution of continuity of bone or muscle. In the second case the patient died a month after the apoplectic seizure. He had suffered hemiplegia in the side opposite to that on which the cerebral lesion had occurred; but in this part, at the time of death, nothing except an undulating and firm cicatrix was discovered. The limbs regained their mobility in proportion as cicatrization

from passions of the mind, and from sympathetic affections.

Case 1.

Epilepsy from deposition of serum and extravasation of blood.

A sexagenarian subject to epileptic fits was attacked with fever. This was speedily followed by an epileptic paroxysm of which he died.

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advanced. The subject of the third case fell from a scaffold during his recovery; the lips of the cicatrix at their extremities were still united, but the central parts appeared to have been recently disjoined.—*Med. Repos. Feb.* 1819.

From observations made by Dr. Thompson after the Battle of Waterloo, it appears that when paralysis occurred from sabre wounds on the head, it uniformly manifested itself on the side opposite to that on which the injury was inflicted; but there was no other fixed relation between the part injured and that affected with palsy—so that a wound of the right parietal bone, in one patient, was succeeded by palsy of the opposite arm and leg; in another, by slight paralysis of the left side of the mouth and complete palsy of the left leg; in a third case it gave rise to perfect hemiplegia of the left side.—*Reports on Cases at Waterloo.*

That form of paralysis designated shaking palsy has been ably discussed by Mr. Parkinson. He supposes the proximate cause to be a diseased state of the medulla spinalis, in that part which is contained in the canal formed by the superior cervical vertebræ, and extending as the disease proceeds, to the medulla oblongata."

Sometimes there is great discrepancy between the state of the mental faculties and the solution of muscular action: the latter may be limited to an unimportant part of the body, when the intellectual powers are nearly or totally destroyed. At other times there is an almost universal state of paralysis with unimpaired intellects. During many years I have been in occasional attendance upon a case of this nature. The gentleman in the meridian of life became affected with vertigo, to which shaking

Dissection. Betwixt the dura and pia mater a serous fluid was universally deposited, and on one side there was a portion of extravasated blood. The ventricles were filled with serum, and the small glands of the choroid plexuses were tumid.

Valsalva, Epist. ix. 2.

I am indebted to Albertini for the following case.

Case 2.

Epilepsy from dentition, with hydrocephalus.

A boy seventeen months old, the first-born of noble parents, had a larger head than is usual at that age; his eyes were dull, one part of his thorax was depressed, his legs were not adequately firm, and his muscles were flaccid.

When the child was scarcely a year old, a kind of epileptic affection arose from dentition, which was removed by the abstraction of two ounces of blood. When cutting one of the upper dentes canini, he was first seized with fever, then with a violent paroxysm of epilepsy. The physician found him breathing with stertor, and his pulse imperceptible. By the application of external stimuli the violence of the fit somewhat decreased, and when the pulse became perceptible three ounces of blood

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palsy succeeded. Many times in the year it has been requisite to abstract blood to relieve the oppressed state of the head; but he has been getting worse by imperceptible degrees, so that for nearly two years he has been incapable of moving a limb, or supporting his head: in whatever position he is laid there he must remain in a state of perfect immobility; yet he can speak and swallow—and his reason, in general, is unclouded.—*Ed.*

were withdrawn from the arm; the difficulty of respiration abated, and the little fellow raised his arm and rubbed his forehead. Nevertheless his head was still greatly oppressed; the eyes were insensible to light, though kept open; and death occurred about the end of the sixth hour from the commencement of the paroxysm.

Dissection. There were about two ounces of a bloody fluid within the cranium, and the cerebrum was of a soft texture. That part of the thorax which was most straitened contained a little extravasated blood, which appeared to have escaped from an ulcerated portion of the lungs.

Morgagni, ix. 4.

Case 3.

Epilepsy from deposition of serum, and induration of the cerebrum.

A youth, eighteen years of age, who resided in a marshy situation, became anasarcous, on account of which he was brought into the hospital at Padua. Under the use of diuretics the swelling subsided, but he was attacked with epileptic fits, which he had not previously suffered; and the paroxysms were of frequent recurrence. Within the last seven days he manifested a degree of fatuity and a propensity to sleep, and at length acute febrile symptoms were united with the preceding affections. This complication of urgent diseases, he was not able to sustain.

Dissection. The *post mortem* examination was limited to the head, and was conducted on the 18th of March 1741. The face was œdematous.

When the calvarium was removed and held to the light, the borders of all the bones which form the sutures were diaphanous to the extent of half a digit. The vessels contained only a little blood, but there was a redundance of serous fluid beneath the pia mater which resembled jelly, mixed with bubbles of air. The texture of the cerebrum in general was unnaturally firm, but the fornix was soft; the choroid plexuses, which were of a pale colour, were so extremely flaccid that the membrane lying between the right and left sides was lacerable by the slightest touch. The anterior part of the left corpus striatum was unusually protuberant, and a small quantity of yellowish serous fluid was found in the lateral ventricles.—*Morgagni*, ix. 9.

Case 4.

Epilepsy from deposition of serum and turgescence of vessels.

A man who was employed as a cook, and who had previously suffered from diseases of the urinary organs, was brought into the hospital of St. Mary de Vita at Bologna on account of a severe attack of continued fever. He was bled, but his disorder progressively increased, and about the twelfth day from the onset of fever, he died epileptic.

Dissection. One of the kidneys was of a rounded figure; it had a somewhat carcinomatous appearance and contained calculi: the other, which seemed to perform the functions of both, had acquired double its natural magnitude. The pleura was inflamed, and the heart and large vessels in the thorax were turgid with black and fluid blood,

which was still warm although ten hours had elapsed since death.

All the vessels of the head, especially those upon the surface of the brain were red, and turgid with blood, and a small quantity of limpid fluid was contained in the ventricles.—*Morgagni*, ix. 12.

Case 5.

Epilepsy from turgescence of vessels in the cerebrum.

A porter, about forty years of age, having been greatly wearied with unusual exertion in the month of August 1729, whilst his stomach was distended with food, but more especially with fruit, was attacked with epilepsy, with which he had never been previously affected. He was brought into the hospital, where, within a few days, he was destroyed by the disease.

Dissection. The head, which alone was examined, exhibited nothing worthy of observation except turgescence of the vessels of the cerebrum.*

Morgagni, ix. 14.

Case 6.

Epilepsy from peculiar structural disease in the cerebrum.

A woman, sixty years of age, who had been subject to epileptic attacks for nearly two years, was received into the hospital about a month before death, on account of injury received upon the head from a fall during one of the paroxysms. When the fit came on, she at first trembled slightly, then became rigid, and lay immoveable

* The state of the stomach not having been investigated leaves this case very imperfect.—*Ed.*

and silent until the attack passed off. A degree of stupor remained afterwards, with but little aptitude to speak. Slight delirium, conjoined with acute fever, supervened; but during the two or three days immediately preceding death, she was perfectly rational.

Dissection. There was no appearance of injury in the skull or membranes which could be ascribed to the fall, nor were the vessels of the latter turgid. The anterior third part of the left hemisphere of the cerebrum was much lower than the corresponding part of the opposite hemisphere, and considerably softer in texture throughout its substance. This was evident in the cortical substance, but much more so in the medullary, which presented the appearance of a semi-transparent jelly, having a brownish-cineritious colour. It did not exhale an offensive odour; nor was there either pus or extravasated blood. It seemed to be disease of a peculiar character.—*Morgagni*, ix. 16.

It might be doubted whether the origin of this disease should be traced to the injury from the fall, or whether it had previously existed and was the occasion of the epilepsy; the appearances on dissection and the analogy which it sustains with other instances, confirm the latter opinion. No other part of the body was examined except the organs of generation.—17.

Case 7.

Epilepsy from disease in the cerebrum.

A short and slender man, who had previously been the subject of epilepsy, was carried off in a

few days by an aggravated recurrence of the disease in April 1722.

Dissection. The right kidney was larger than the left. There were appearances of beginning ossification at the curvature of the aorta. Within the cranium some parts of the vertebral and the basilary arteries were unequally dilated. At the extreme parts of the optic thalami the medullary substance was of a colour inclining from yellow to black, and was so tender in its structure as to appear as if it was in a half-rotten condition.

Morgagni, ix. 18.

Similar transmutations of the substance of the brain have been observed by other anatomists, in epileptic cases.—19.

Case 8.

Epilepsy from abscess in the cerebrum, with perforation of the cranium.

A man having been struck upon the head by a log of wood, was seized with epileptic affections. It was said indeed that he had been liable to attacks of this disease before: if it were so, the recurrences were considerably more frequent during the few months he survived the injury, especially within the last week of his life. He likewise was agitated with so much tremor that it was requisite to confine him with cords to prevent his falling out of bed. Complete amaurosis supervened; he saw nothing, though no unnatural appearance was observable in the eye except dilatation of the pupil. He progressively became worse until his decease in Feb. 1728.

Dissection. The head was brought to me for

dissection, as I was then teaching anatomy in the college. The arch of the cranium protuberated inwards, except in those parts where it is naturally thick; and it was incredibly thin. At one part on the right side of the os sincipitis, there was a foramen nearly large enough to admit the point of the little finger; which was closed with a membrane. There was no appearance of caries about the edges of this perforation, or in any other part of the cranium. With this foramen a small orifice in the dura mater corresponded, from which issued a fluid of a brown colour. This orifice communicated with a cavity sufficient to receive the bulk of a large egg. The cavity was filled with a fluid resembling that which has just been mentioned, in which some coagula of blood had subsided; it was of an irregular form; its surface was unequal, and the circumjacent parts of the brain were of a dirty brown colour, indicative of semiputrefaction. The corresponding thalamus of the optic nerve, though distant from the cavity, appeared shrunk; but in neither of the optic nerves, nor in either eye was there any perceptible disease. The left lateral ventricle contained a considerable quantity of pellucid fluid. The choroid plexuses were of a pale colour, and possessed a few small vesicles; the whole cerebrum was of an obsolete yellowish hue; and its vessels were exceedingly turgid with blood of a black colour.—*Morgagni*, ix. 20.

The following case was communicated to me from my friend Mediavia.

Case 9.

Epilepsy from abscess and other lesions in the cerebrum, with caries of the skull; from the venereal disease.

A woman who had two syphilitic tumours on her forehead took mercury until a ptialism was excited. The left tumour disappeared, but in the place of it a pulsating protuberance arose. Before the use of mercury she had been subject to epilepsy; she had an epileptic attack once during the treatment; and when the tumour had subsided she was harrassed with convulsions. She lay in a state of coma for some days before death, which happened about the middle of October 1739.

Dissection. The pulsating tumour of the forehead was found to be the brain, which instead of being covered in this part with its proper meninges, was covered with a membrane as thick as pasteboard, but so flaccid as to be easily torn between the fingers; and the cortical substance beneath it was as firm as the texture of liver. The remainder of the left hemisphere, except the posterior part, was much softer than it ought to have been, and within it was a cavity the size of a small walnut surrounded by soft and livid parietes of medullary substance, which contained a liquid in which filaments were suspended; part of which was of a dark colour, and the rest was like serum. It neither communicated with the tumour on the forehead nor with the ventricle. It was near the latter, and about two digits from the former. On the right side the bone was not completely perforated.

Morgagni, ix. 23.

Some doubt may be entertained whether the abscess in the cerebrum originated in the syphilitic affection, but it cannot justly be questioned that the indurated state of the cerebrum arose from that cause.

The cortical substance of the brain has been found partially indurated, and even scirrhous in other cases of epilepsy. In a seaman who had been the subject of this morbus comitialis for a long period, the accessions of which at last were extremely severe, Kaavius found that the cortical substance of the brain was not only greatly indurated in every part but in many places scirrhous, and in others, especially towards the vertex, almost cartilaginous. In a case related to me by Walthieri, the cerebrum at the part near the crista galli was callous, and intimately connected with the dura mater. By other anatomists an abscess has been discovered in the brain after epilepsy.—24.

Epilepsy from ossification of the dura mater.

The dura mater has been found ossified, or spiculæ of bone have been formed upon that membrane in epilepsia. In a woman who had long been subject to its attacks, and who died from injury of the head without fracture, a bony prominence was found in the falx. In the head of a young man, who had been epileptic for a long time, exceedingly small spiculæ of bone were discovered; their bases were connected with the dura mater, and their very acute apices directed against the pia mater. Experiments upon the dura mater have apparently led to differences of result.

When Ridley perforated this membrane in a dog, convulsions were not induced; but the animal was greatly convulsed under a similar experiment made by Paul Molinetti. In a case of epilepsy which was found to have arisen from bony spiculæ on one side of the falx, relief was obtained by bleeding. In the experiment performed by Ridley hæmorrhage preceded the irritation of the membrane. May it be conjectured that unless the membranes are equally tense, similar consequences do not ensue?—*Morgagni, sparsim.*

Case 10.

Epilepsy from anger.

I formerly heard of a nobleman at Padua, sixty-four years of age, who about twenty-two years before was unexpectedly seized with a paroxysm of epilepsy, from excessive anger; and subsequently, on seeing the person by accident who was the cause of his provocation, though a considerable interval had elapsed, he again fell under a similar attack. The disease often recurred afterwards, when the offensive person was absent; but within the last two or three years the violence of the disease moderated—indeed it then consisted only of obscurity of intellect.—*Morgagni,* ix. 5.

Case 11.

Epilepsy from terror.

When I attended upon that great master in the healing art Albertini, he was called to a youth of noble family, who was seized with epilepsy from terror; and the attack was frequently renewed

afterwards. When other means had proved unavailing, the disease was removed in forty days by sedatives. Twice every day oil was injected into the rectum; opium was administered internally; and during the paroxysm some relief was obtained by rubbing the spine with a soft hand anointed with oil.

At the end of the first accession blood was abstracted. This he would have done had no epilepsy supervened, having observed, that after powerful affections of the mind some trace of disorder remains in the brain, which discovers itself by unwarrantable fears, or by unpleasant dreams. This I have also occasionally observed myself.—*Morgagni*, ix. 6.

Case 12.

Epilepsy from abdominal disease.

Anastasia Poggi, a grave and virtuous priest, was seized with epilepsy in his sixty-eighth year. He was rather corpulent, and of a florid complexion. The first attack was preceded by pain in the right hypochondrium, and was removed by bilious dejections. The subsequent accessions were generally preceded by a sensation compared to the ascent of vapour from the hypochondria to the head. He was constantly annoyed by a sense of fulness about these parts, which was increased by taking food, but more especially after liquids. The pulse was slow. There was no symptom of affection in the head, till the disease had continued for some considerable time, when his head felt heavy, and

he had some dulness of intellect. Under these circumstances he repeatedly derived advantage from a diminution of the vascular plenitude by bleeding. The attacks were generally of short duration, but not slight in degree. The eyes were distorted, the limbs agitated, and all sensibility was suspended. There was frequently a sense of suffocation; and sometimes these symptoms were accompanied with stertorous respiration, and an involuntary flow of urine. When the quantity of urine was augmented, either spontaneously or under the employment of diuretics, the epileptic symptoms were frequently exasperated; but they were never mitigated by this occurrence. After various other means usually resorted to had proved unavailing, half a grain of opium, taken at the beginning of the night, rendered him essential benefit. By this treatment tranquil nights and comfortable sleep were obtained, though, previous to this, he was sometimes roused by sudden difficulty of breathing, which created an apprehension of hydrothorax. So far from the head being oppressed by the opiate, the heaviness and dulness which followed the daily attacks were removed; but when the opiate was omitted these symptoms returned. Having, on one occasion, passed an unusually disturbed night from that cause, the pulse became unequal; and other remedies having failed to adjust the deranged functions, the narcotic was again resorted to, by which quiet nights were secured; and not only was the inequality of the pulse decreased, but by persevering in the employment of it every night, the pulse, which had

previously been slow, acquired a more natural degree of frequency.

No fit having returned for thirteen days, the opium was omitted; but the patient again passed nights of restlessness and watching, and the attacks of difficult respiration became exceedingly troublesome. These affections too were allayed by a recurrence to the same medicine: the fits were reduced to one a month; and at length two months having elapsed without a single attack, I took leave of my patient.

During the latter period of my attendance on this case, the opiate was only given occasionally. Throughout the treatment great attention was directed to the state of the chylopoietic viscera; for I believe these sudden incursions of disease originated from morbid actions in them, and not from redundant serum in the encephalon.

Morgagni, ix. 7.

The following case was communicated to me by two medical friends.

Case 13.

Epilepsy from deposition of serum in the brain; probably originating from worms.

A young man eighteen years of age was seized with fever, without any apparent cause. He did not complain of pain or uneasiness in any part except the head: epilepsy ensued, and within twenty-four hours from the commencement of the febrile affection the youth expired.

Dissection. In the anterior part of the cerebrum

a quantity of mucous serum was deposited betwixt the dura and pia mater. It had detached these membranes from each other, and compressed the cerebrum. The stomach appeared to be inflamed, and a ball of lumbrici was found in the duodenum.

Morgagni, lxii. 2.

Many examples of epilepsy, arising suddenly from mental passions, or commencing in parts remote from the brain, have been assigned to medical records; it is not improbable, however, that on some occasions, when the disease appeared to originate in a distant part, its primary though latent cause was seated in the brain.

Whether epilepsy originates from induration of the cerebrum, from abscess, from lesion of a peculiar character, from turgescence of vessels, deposition of fluid, or from any other cause, the cure is generally difficult—often beyond our reach; and when means are available, it will be manifest how greatly they must be diversified, to adapt them to the varied exigencies of disease primarily seated within the cranium, or derived from disease in some other part. The consideration too is urged upon us, how greatly it behoves medical practitioners to combine their efforts to elucidate this disorder; that by diligent observation, and by accurate dissection, each may fulfil his part towards an object so momentous*.—ix. 26.

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* Of late years much attention has been directed to the morbid condition of the medulla spinalis in this and in other diseases. In a considerable number of epileptic cases inspected by M. Esquirol, some part of the spinal cord was found to deviate from its natural appearance or texture, either in its medullary substance

SECTION VIII.

Spasmodic and Convulsive Diseases.

Though convulsive affections must often be regarded as only forming a part of other diseases,

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or in its membranes. There was no uniformity as to the seat of this structural mischief. Out of eight cases, which the author states were not selected from others to establish any new theory, three presented morbid appearances at some part between the tenth and twelfth dorsal vertebræ; two between the sixth and eighth, and one of them also at the lumbar extremity of the chord; in two instances the disease was exclusively seated at this extremity. In the remaining case not only was there softening of structure of the lumbar extremity, but from the bulb of the brain through the whole extent of the spinal chord, hydatids of various sizes were observed. They were contained in the sac formed by the spinal membranes. Not only was the situation variable but also the injury itself. In the *first* the spinal marrow was softened and of a slightly brown colour: in the *second*, it was of unusual density: in the *third*—the meninges were injected, and the spinal marrow softened at its lower extremity: in the *fourth*—there was a point of suppuration in the posterior part of the left hemisphere of the brain; the arachnoid coat of the spinal marrow towards the tenth and twelfth dorsal vertebræ, presented a brownish appearance; and in the two corresponding points the medullary substance was softened: in the *fifth*—the arteries of the basis cranii were in several points cartilaginous and ossified; the parietes of the left ventricle of the heart were an inch in thickness, whilst the cavity itself measured but five or six lines; at the eleventh or twelfth dorsal vertebræ the sheath of the spine was brownish, and the medullary substance was softened: in the *sixth*—the whole external surface of the spinal membrane was studded with osseous scales, of a dull white colour, and from one to two lines in diameter; towards the seventh and eighth dorsal vertebræ, and at the lumbar extremity of the spinal marrow, the medullary substance was softened: in the *seventh*—the hydatids existed as

as, for example, hysteria or epilepsy, yet sometimes they exist independent of any such relationship. Tetanus, one of the most dangerous forms of irregular action in muscles, most frequently arises from an external wound or ulcer, but it also originates from other sources.

Case 1.

Tetanus from serous effusion into the left ventricle of the brain.

A young man, about twenty-six years of age, was first affected with slight swelling of the fauces, and impaired appetite. To these complaints, after some days, spasmodic contraction of the left arm was added, so that it became immoveable. Soon

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already mentioned, and the medullary substance at the lumbar extremity was softened: in the *eighth*—the subject of which was a child six or seven years old, the spinal membrane was gorged with blood; the medullary substance exhibited a yellowish colour, and was softened in the vicinity of the sixth and seventh dorsal vertebræ. Dr. E. observes that out of ten epileptic patients who died at La Salpetriere between the first of February and first of June 1817, nine were submitted to examination, and in seven of them there were lesions of the spinal marrow or its membranes.

This disease has been known to arise from portions of depressed bone, irritating the brain; it has arisen in the progress of rheumatic, gouty, uterine, and other affections; and a sympathetic epilepsy has been brought on from the local injury of nerves. So powerfully does this cause sometimes operate that in one instance it was produced by irritation in some nervous filaments distributed to the fingers. In a person who had been subject to epileptic fits, total exoneration from future attacks was experienced after cutting the dentes sapientiæ at the age of twenty-two. It not unfrequently derives its origin from irritation in the stomach and bowels.—*Ed.*

afterwards the whole body was similarly affected. It became immoveable and rigid, but after a short time he regained a little power of motion in the hands and feet. From the time of seizure till that of death, a period of five days, he had profuse perspiration. He expired at the beginning of the fifth day, during a renewed incurvation of the body to one side from spasm.

Dissection. Numerous red spots were observed upon the skin after death. Within the encephalon no morbid appearances were discovered, except a little serum in the left ventricle. The left cavity of the thorax contained some ounces of serous fluid, and both lobes of the lungs were of a red colour. The pericardium was full of serum.

Valsalva, x. 2.

Case 2.

Tetanus from injury of the hand.

A countryman, in good health, perforated his hand betwixt the metacarpal bones of the index and middle fingers, with splinters of wood. He did not consult a surgeon till the whole limb was afflicted with spasm, on the eighth day after the accident. He then came into the hospital, where some splinters were removed from the wound, and various measures were resorted to, but without success. All the muscles of the arm were retracted by almost incessant convulsive action, and he died at the expiration of two days.

Dissection. The hand and arm were not much swelled. The orifice of the wound was narrow, and nearly of a circular form, but so deep that it

passed between the bones already mentioned, almost to the back of the hand. The tendinous expansion of the palmaris, the muscular fibres of the adductor pollicis manus and of the interossii were perforated. A fragment of wood remained strongly fixed in the wound. The veins of the thorax, neck, and head, were distended with black and fluid blood. There did not appear to be any unnatural deposition of serum within the cranium, or within the spinal canal; the choroid plexuses were of a reddish brown colour, and the medullary substance was more vascular than usual.

Morgagni, liv. 44.

Case 3.

Tetanus from injury of the heel.

A cart-wheel passed over the lower part of the left heel of a youth seventeen years of age; but no other injury was apparent except laceration of the common integuments. The cure of this apparently slight injury, too, was advancing satisfactorily for some days, when the muscles of the neck and back became rigid. At intervals the whole body was agitated by the most violent tremors. These symptoms continued for upwards of twenty days, during which time his intellectual faculties were unimpaired. He then vomited a lumbricus teres; stertorous respiration gradually came on, and proved the harbinger of death.

Dissection. The body was examined in the evening of the day on which he died, when it appeared that the wound had nearly healed. The abdomen contained a small quantity of a serous

fluid; the intestines were greatly distended with gas; and a dead lumbricus lay in the colon. Into the left cavity of the thorax a little serum had been effused, and the texture of the lungs on that side resembled liver. The blood which occupied the right cavities of the heart contained bubbles of air. In the right lateral sinus of the dura mater there was coagulated blood, in the left the blood was fluid, and some moderately large air bubbles were blended with it. There were numerous bubbles also beneath the pia mater, especially about the anterior lobe of the left hemisphere of the cerebrum; and there was a serous deposite under the same membrane. The ventricles were occupied by no inconsiderable quantity of serum, and which also flowed copiously from the vertebral canal, especially when the loins were elevated. The cerebrum was of a firm texture, but the cerebellum was flaccid.—*Morgagni*, liv. 49.

Tetanic symptoms have sometimes originated even from a much slighter injury than that which was sustained in the instance above mentioned The following case verifies this remark.

Case 4.

Tetanus from the bite of a sparrow.

A young lady of Verona, sixteen years of age, was bitten on the forefinger by a tame sparrow, at the external part of the first joint; a nervous filament as well as the common integuments must have been injured, for the finger became instantly bent, and could not again be extended or moved.

The wound suppurated and became increasingly painful; the hand was swollen and contracted, and after some days fever supervened; but all these symptoms had disappeared, and the wound had nearly healed, when, most unexpectedly, on the fourteenth day from the bite, tremor commenced in the feet, and soon propagated itself to the hands and whole body. She fell into a state of protracted and alarming syncope. On recovering from this condition the spasmodic affections did not cease, but recurred after short intermission, sixteen or eighteen times a day. I was consulted by letter on the sixth day, which was the 31st of July 1743, when the preceding circumstances were detailed; but I heard nothing of the case afterwards.—*Morgagni*, liv. 45.

Case 5.

Spasmodic affection from deposition of serum on the dura mater.

A young woman, about twenty-six years of age, labouring under acute fever, was seized about the seventh day, with a spasmodic affection of the muscles of the face, so that, when interrogated, she laughed with the sardonius risus, and the convulsive action became so extensive and violent, accompanied with delirium, as to demand restraint to confine her in bed. She died on the ninth day, and about one hour previous to that event all the premised symptoms disappeared.

Dissection. A little serum was observed to flow from the right ear. There was nothing unnatural

in the head, except a few drops of serum upon the dura mater; and a small quantity of very diluted blood flowed down, which probably escaped from vessels lacerated when the calvarium was torn from that membrane. The lungs on the right side adhered to the ribs and sternum, and this cavity of the thorax contained about nine ounces of serous fluid. Upon the same lung there was a concretion of lymph.—*Valsalva*, x. 5.

Although it is possible that the cause of the convulsions might have eluded discovery, the few drops of serum would be adequate to their production.—*Morgagni*, 6.

Case 6.

Spasmodic affections from deposition of serum betwixt the membranes.

Bartholomew Manzoli, a marquis and senator of Bologna, when young, was subject to expectoration of a quality which led two eminent physicians to believe that he laboured under phthisis. Having recovered from that disease he was afterwards afflicted with stone. About six years before death, when he had become an elderly man, he was attacked with vertigo; and within the last year of his life he often had to endure slight spasmodic and paralytic affections, united with a peculiar numbness of the whole side, generally the left, from which bleeding always relieved him. He was sometimes oppressed with difficulty of respiration; his legs swelled, and at length ulcerated, and discharged a serous fluid. About a month before death this œdema subsided, and within the same period the

quantity of urine diminished. The state of respiration was now constantly troublesome, attended with an uneasy internal sensation, about three digits above the umbilicus, at which part he said the disease originated, and whence it seemed to ascend as often as an accession of increased difficulty of breathing was threatened. He had no thirst nor sense of weight in the chest; but tumefaction of the abdomen came on; and convulsions with stammering articulation tormented him, especially during the few last days of his life. For two days before he died his mouth was distorted, and he scarcely spoke with coherency.

Dissection. The tumid state of the abdomen chiefly arose from the intestines being distended with gas. The liver was slightly indurated, and its colour was scarcely natural. The pelvis of each kidney contained granulated and yellowish calculi. Both cavities of the thorax and the pericardium were burdened with a great redundance of serum, and the heart was flaccid.

Betwixt the membranes of the brain and within its convolutions, there was a copious deposition of serous fluid, and in its ventricles, as well as at the basis of the cranium, no inconsiderable excess of this fluid was discovered.—*Valsalva*, x. 11.

It is probable that the sensation of the disease beginning about the umbilicus was seated in the mesenteric plexus of nerves.—*Morgagni*, 12.

Case 7.

Spasm and paralysis from turgescence of vessels, and from deposition of serum in the brain and within the spinal canal, with incurvation of the spine.

A hemp-dresser, forty years of age, of pale countenance, but apparently in good health, perceived a swelling near the cartilago ensiformis about two years antecedent to his death. He was not without some apprehensions of serious consequences, though the swelling occasioned him no real inconvenience. Various means were employed, but in vain; it progressively increased in size, and at length afforded some impediment to respiration. Fifty days previous to death he was attacked with a pricking pain at the lower dorsal vertebra, sometimes extending downwards into the loins, or upwards to the scapulæ, united with general lassitude. Eleven days before death the right leg was seized with numbness, and soon afterwards it was paralyzed; the limb, however, was deprived rather of the power of motion than of the sense of feeling. Three days afterwards he could void no urine, and though, at first, it was readily drawn off, a thick mucus soon obstructed the catheter. An obstacle subsequently presented itself to the introduction of the instrument, and the abdominal parietes were universally distended. The patient was thirsty; he could not lie down from the pain in the back, and, when attempting it, respiration was rendered much more oppressive. Neither his legs nor feet were tumid. Spasmodic affections of the upper limbs and of the trunk now at intervals began to torture him; they continued about a quarter

of an hour, and excited vomiting, by which a yellow humour was ejected. During these accessions of spasm the mind was beclouded, though at other times its powers were vigorous. At this period the left leg was in the same paralytic state as the right. On the morning of decease his pulse was imperceptible; he appeared much worse, and was carried off by renewed convulsions. This happened about the middle of August 1705.

Dissection. An abundance of turbid fluid was found in the abdomen. The intestines were united to each other by adventitious membranes of coagulable lymph. The liver was of a pale colour, and in the middle of its convex surface there was a small circular cavity, filled with grumous blood. The left kidney contained a small quantity of pus.

The bladder did not contain a large quantity of urine, but its coats were thickened: the vessels upon its inner surface were very turgid with blood. There were some fleshy fibrillæ in the urethra, descending by the side of the seminal caruncle, which had offered resistance to the introduction of the catheter. The testes themselves, as well as their tunics and the scrotum, were verging from inflammation to a state of gangrene.

The tumour at the lower part of the thorax consisted of an increased curvature of the sternum and of the cartilages of the ribs on the right side, in consequence of incurvation of the spine. There was a considerable quantity of turbid serum in the pericardium; the aorta was in an incipient state of ossification, and the vessels of the diaphragm were as turgid as if they had been filled with injection.

When the calvarium and dura mater had been removed, a few drops of extravasated blood were found upon the pia mater near the longitudinal sinus, on the left hemisphere; and the vessels of this membrane over the right hemisphere were greatly distended with blood, and of a black colour. An almost limpid serous fluid was deposited between the convolutions; there was scarcely any in the ventricles, but a large quantity had accumulated about the foramen magnum of the occipital bone; and when the spine was divided at the border of the thorax water flowed from its canal.

The palsy of the lower limbs and bladder must be ascribed to the fluid which possessed the spinal canal; the spasmodic affections to the state of the encephalon and spine conjointly.

Morgagni, x. 13.

Case 8.

Convulsions from turgescence of vessels and deposition of serum, in the brain and within the spinal canal.

A wool-comber, twenty-one years of age, was attacked with fever, in the course of which he had an accession of delirium. Having experienced a remission of the mental wandering, he was brought into this hospital, where convulsive actions were immediately observed in the muscles of the upper limbs, and consequently subsultus tendinum in both wrists. There was no inflammatory crust on the blood which was withdrawn, but it was of an extremely dense and compact quality. An oppressive state of coma ensued; and three days afterwards he died.

Dissection. One lobe of the lungs was somewhat indurated. Having disunited the fifth and sixth vertebræ of the thorax, much serous fluid escaped from the spinal canal. The vessels of the pia mater, on the posterior part of the left hemisphere of the brain, were greatly distended with blood of a black colour; and there was a little serum beneath the same membrane resembling jelly, with some bubbles of air, though it did not appear from any unpleasant odour that decomposition had commenced, and being in the middle of March (1745) putrescence would scarcely have taken place in three days. The brain was indurated, and exhibited bloody points in the medullary structure, which soon spread into drops, indicating the existence of a large quantity of fluid blood. The lateral ventricles retained scarcely any fluid; the choroid plexuses were of a deep red colour; the pineal gland was of a rosy hue. The medulla spinalis being attentively examined from the cranium to the fifth dorsal vertebra, the vessels of its pia mater were so exceedingly turgid with blood, especially its posterior surface, as to resemble an injected part; even the minute vessels of the spinal nerves participated in this turgescence. The abdomen was not opened.—*Morgagni*, x. 17.

Case 9.

Convulsions from deposition of serum, and turgescence of vessels in the lateral ventricles, with abdominal disease.

An old porter was brought into the hospital February 1, 1745. He was speechless; pulsation

was nearly imperceptible; and he was convulsed. On the same day his disease arrived at a fatal termination, and I was unable to obtain any additional information respecting him.

Dissection. The body was brought into the theatre for dissection. The hands were slightly œdematous, and the left side of the chest higher than the right. The liver was indurated, and variegated internally and externally with a whitish and dirty-yellow colour; and the gall bladder was full of greenish yellow bile. The spleen was large; its coats on the convex surface had two bony laminæ in them, but its internal texture was of a pultacious consistence. There was a small hydatid upon the kidney; and the parietes of the bladder were thickened.

The heart was firmer than usual, and covered with fat. The valvulæ tricuspides and mitrales were thickened and indurated; the semilunar valves were ossified, and the aorta exhibited opaque marks. The cranium contained but little fluid; beneath the pia mater, however, serum was deposited, which presented an appearance of jelly; and the vessels distributed upon the membrane of the lateral ventricles were exceedingly loaded with blood.—*Morgagni*, x. 19.

Case 10.

Convulsions from deposition of serum and turgescence of vessels, originating in terror.

A nightman, about fifty years of age, having a healthy aspect, though rather plethoric and so addicted to liquor, that he was often inebriated,

was occupied with his servants in emptying the unwholesome privies of the hospital, in the night, as is usual on such occasion. At a time when he happened to be alone, he suddenly fancied that he saw an apparition, clad in white: tremor immediately agitated his whole body, and his mouth was distorted by spasm. In this lamentable condition his servants found him and conveyed him to bed.

Antispasmodics having been resorted to, the trembling subsided, and the pulse became more firm. He was bled in the night, and also in the morning, after which he had still farther remission of the irregular muscular actions, and the pulse expanded and became febrile. Blood was again copiously abstracted, nevertheless fever continued; and occasionally the whole body was disquieted with spasm. He did not speak intelligibly after having narrated to his servants the circumstance that had transpired, yet by gesture he manifested a knowledge of the persons about him, and his expression indicated that he underwent severe pain in the head. On the 31st of February 1747, six or seven days from his fright, his bodily sufferings terminated in death. The body was brought into the theatre for dissection on the following day.

Dissection. The fingers were extremely rigid, but the arms were flexible. The intestines were inflated with gas; and the liver and spleen were of a bluish colour. The liver, too, was moderately enlarged.

The vessels of the pia mater, even the most minute, were as turgid with blood as if injection had been urged into them; and this vascular

turgescence even pervaded the lining membrane of the ventricles, and the medullary substance itself. When the commencement of the spinal marrow was lightly compressed, blood oozed from it, a circumstance which is rarely seen. Both the lateral ventricles abounded with a limpid fluid, and the choroid plexuses were florid. The fornix and the crura of the medulla oblongata were of a soft texture. The lungs appeared as if they were rather swollen; the heart did not contain any blood; but this circumstance might have happened in consequence of its having flowed through the vessels divided below the diaphragm, especially as the blood was fluid.*—*Morgagni*, lxii. 5.

* In reference to traumatic trismus, Larry in his Memoirs of Military Surgery says "on opening the bodies of such as died "of trismus, I found the pharynx and œsophagus considerably "constricted; their internal membrane red, inflamed, and covered "with a viscous humour of a reddish colour." The translator of Larry's work subjoins a note in which he describes some extraordinary appearances in the bodies of persons who died of tetanus in the Island of Barbadoes, under his own observation. "The stomach and whole extent of the alimentary canal down to "the rectum contained an abundance of a viscid, tenacious, "yellow matter, resembling liquid gamboge, which, on being "exposed to the air, immediately effervesced, and continued to "foam for the space of a minute. This matter, very different "from any secretion or excretion of the human body, was found "more or less in all subjects who died of tetanus."

Numerous and interesting facts have lately been brought forward which tend to show that disease in the medulla spinalis, or its membranes, is a very frequent cause of tetanus and other spasmodic diseases, and the most prevailing departures from the natural state are inflammation, increased plethora of vessels, and serous deposition. The membranes of this medullary chord have been occupied by white laminæ in tetanic cases, but

SECTION IX.

Insanity.

Case 1.

Insanity from deposition of serum.

A virgin upwards of twenty years of age, having been refused admission to a nunnery which she

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the frequency of their occurrence remains to be determined. On examining the body of a man who died tetanic seven days after receiving an injury on the internal condyle of the elbow, Mr. Brayne relates that a very turgid state of the venous system of the spine was observed from the occiput to the first lumbar vertebra, throughout which extent this canal was opened. The dura mater was of a deep red colour, in many parts approaching to purple; the pia mater in its whole extent was much more vascular than usual, gradually increasing in redness from above downwards, and two or three inches of the inferior dorsal portion were suffused by a continuous blush of inflammation, and in certain spots there were seen three small, hard, white laminæ, which appeared to lie between the arachnoid membrane and pia mater, but were seated in the arachnoid itself. He also alludes to a case of tetanus after compound fracture which occurred in St. Thomas's hospital two years before, in which several inches of the spinal chord were thickly studded with these laminated depositions, and all the vessels of the pia mater were very turgid and tortuous.—*Med. Repos. July* 1821.

Trismus in connexion with spasms of the whole body has been known to arise from hysteria. The trismus nascentium appears to have been often connected with the development of irritation about the umbilicus. Dr. Palmer has related a case of contraction of the voluntary muscles, particularly those of the upper extremity, consequent on the inhalation of charcoal vapour. It cannot be doubted that spasmodic affections may likewise arise from all the sources of nervous irritation.

Morgagni has recorded the case of an infant in which clonic spasm of the upper limbs, extending to other parts of the body,

greatly desired to enter, her intellects became somewhat impaired. She began to talk incoherently, and frequently rejected food. For some

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was connected with intestinal and hepatic derangement; and in no disease is it of greater moment to observe the condition of these functions, for perhaps to this cause and to the irritation of teething, most of these occurrences in children are ascribable. The former of these is also a fruitful source of spasm in adults. Whether in the following instance of its invasion of the heart and diaphragm, as well as other muscles, the disease should be traced to an intestinal or uterine origin, perhaps combined with excitement from premature exertion, I leave undetermined.

Mrs. Wood, a young and healthy lady, was delivered of her fourth child on Monday, Feb. 12, 1821. She had a favorable labour, but the after-pains were unusually severe. On Thursday she was so well as to be sitting up with her friends at tea, when I called upon her. On Friday the bowels being confined she took a little castor oil, but it had not operated when in the night she was seized with violent pains in the wrists and arms; and the following morning I found the muscles rigid. Over the whole body, she felt a tingling sensation in the skin. The pulse was eighty, the head was entirely free from pain, and the tongue moderately clean. She had no evident internal disease. By this time there had been alvine evacuation; and the excrement did not exhibit any peculiarly unnatural appearance. At half past five in the afternoon she was seized with tightness across the chest, accompanied with acute pain. Before seven o'clock I attended and found her in the most excruciating agony, and the most imminent danger. She could scarcely breathe and pointed to the region of the heart and diaphragm as the seat of pain; though she had repeatedly endured laborious parturition without a groan, from the agony now experienced she screamed violently. One moment she sought relief by begging to be raised up—the next, by requesting to be laid down—every posture was solicitously tried but without any mitigation of suffering. The pulse generally was imperceptible, and when it could be felt it beat in the most hurried and irregular manner. Whilst there was this painful affection of the involuntary muscles, her torment was aggravated by an

months afterwards she not only had irregular accessions of fever, but the maniacal symptoms acquired a more furious character. Her strength gradually decreased, and she died.

Dissection. The cerebrum was humid, and a small quantity of serum occupied the lateral

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occasional increase in the degree of contraction of the muscles of the limbs, and it was evident that without a speedy rescue she must die. I opened a vein, expecting almost instant death; and the blood flowed impetuously—but the pulsation of the artery was not developed, and she did not at the time experience relief from the abstraction of about twelve ounces. I then administered a dram of laudanum, twelve grains of scammony and the same quantity of calomel, washed down with a table spoonful of brandy. In half an hour the pain subsided, breathing became a little more free, the body was covered with a most profuse perspiration, the pulse gradually unfolded and became more and more regular, and at ten o'clock I left her in a moderate tranquil state. The blood was buff and cupped. The bowels were not opened till the following morning. In the progress of recovery she had two or three slight attacks of similar affection which were removed by sixty drops of laudanum, with the scammony and calomel.

As Morgagni did not bestow the same attention on the pathology of the spine, as on that of the head, I shall just advert to the division of its diseases adopted by Dr. Abercrombie, though it does not exclusively relate to the subject of this section. 1. Inflammation and suppuration. 2. Serous effusion. 3. Gelatinous effusion. 4. Induration of the chord. 5. Thickening of its membranes. 6. Destruction of portions of the spinal chord. 7. Extravasated blood. 8. Hydatids and tumours. 9. Ossification of its membranes. 10. Fungous excrescences. 11. Compression from diminution of the spinal canal. 12. Increased vascularity and turgidity of the vessels of the spinal chord and its membranes.

Its injuries are derived, 1. From concussion. 2. From diseases of the vertebræ. 3. From affections of the processus dentatus. *Ed. Med. J. Jan.* 1818.—*Ed.*

ventricles. On one of the choroid plexuses there were four enlarged glands. They were solid, of a yellow colour, and somewhat spherical.

Valsalva, viii. 2.

Valsalva has only left the preceding dissection in reference to this disease. Had he possessed as frequent opportunities of dissecting the bodies of lunatics as he did of attending them when living, undoubtedly he would have observed considerable induration of the brain, a circumstance that has uniformly presented itself to me, and which I shall confirm by cases.—*Morgagni*, 3.

Case 2.

Insanity from deposition of serum and induration of the cerebrum.

A tall and robust youth became insane in June 1729. His physicians, about the end of that month, ordered a pint of blood to be withdrawn from the temporal artery. However, within an hour after the operation he was found dead. But the real fact seems to have been, that he died in consequence of ill treatment from his keeper, who being irritated by his having removed the bandages from the punctured artery, beat him about the abdomen and eyes, fixed a tight bandage about his neck, and left him under these painful circumstances.

Dissection. On the following day the body was examined. The face was black and blue; the nasal bones were fractured; the abdomen was tumid, and in many places of a green and livid colour. The lungs were moderately turgid, the aspera arteria contained some frothy mucus, the

pulmonary vein was occupied by a large quantity of fluid blood; and the valves of the pulmonary artery were indurated.

The vessels of the dura and pia mater were greatly distended with black and fluid blood, as were those also which are distributed upon the septum lucidum and the membrane of the lateral ventricles. The ventricles contained a large quantity of turbid fluid. The choroid plexuses were red and vesiculated; one of the vesicles was as large as a moderate-sized grape, in the coats of which, vessels as large as those in the plexus itself were observed. The cortical and medullary structures of the cerebrum were indurated, whilst the cortical substance of the cerebellum was rather softer than natural.—*Morgagni*, viii. 4.

Case 3.

Insanity from deposition of serum and induration of the cerebrum, with disease of the heart.

A butcher whose intellectual faculties had been deranged fourteen months, died in the beginning of 1719. It was supposed that his death was occasioned by exposure during a very cold season, to the effects of which he was inattentive.

Dissection. The heart adhered to the pericardium universally. Serum was deposited beneath the pia mater, and the cerebrum was extremely firm in texture. Having reflected the indurated fornix, I observed near each of its pillars a kind of pellucid and knotted lymphatic; and they crept separately towards the pineal gland. The cerebrum and medulla oblongata were extremely firm, so

that there was greater facility in discovering their minute parts; and I apprehend that the brains of maniacal persons are the most suitable for tracing the origin and course of nerves.—*Morgagni*, viii. 6.

Case 4.

Insanity from deposition of serum, induration of the cerebrum, and partial flaccidity of the cerebellum; with extrication of gas.

A woman became the subject of mental derangement, in consequence of a man being killed to whom she was on the point of marriage. She continued in this state for nine years. Twelve months antecedent to death she underwent parturition, without any alteration in the state of her mind. Though wandering about the streets she was quite harmless. She died of pulmonary inflammation in the beginning of December 1725.

Dissection. The head only was examined. Serum was deposited beneath the pia mater, having some bubbles of air mixed with it; and similar bubbles were so crowded in some of the vessels of the cerebrum as to fill them. The medullary substance was of a brownish colour, probably owing to its vessels being unnaturally distended; for this colour diminished at an increased distance from the cortical substance. The whole of this medullary substance was of unusual hardness, and the nerves were unnaturally firm and destitute of their usual degree of moisture. The cortical substance of the cerebellum was exceedingly soft, whilst the texture of the medullary substance of this part and of its pedunculi was firm like that of the cerebrum.

Morgagni, viii. 9.

Case 5.

Insanity from deposition of serum, induration of the cerebrum, and flaccidity of the cerebellum; with dilated vessels.

Towards the close of 1723 I carefully dissected the head and neck of a man who had long been the subject of mental alienation, and who died from slow fever. The carotid arteries and internal jugular veins were dilated. A serous fluid was deposited beneath the membranes. Though it was the fifth or sixth day after death, the cerebrum was indurated; the cerebellum on the contrary was flaccid.—*Morgagni*, viii. 11.

Case 6.

Insanity from deposition of serum, and induration of the cerebrum and cerebellum.

A woman apparently about middle age, who had been afflicted with mental derangement, died in the hospital in 1746.

Dissection. The body was greatly emaciated, and one lobe of the lungs was nearly full of pus. On examining the brain it was observed that the pia mater could be drawn from its convolutions with unusual facility; from which circumstance no doubt was entertained, that serum had existed beneath that membrane. A moderate quantity of fluid was observed in the ventricles, and a larger quantity flowed from the spinal canal. The substance of the cerebrum and cerebellum was harder than usual. The choroid plexuses were discoloured, and in some parts intimately united

by thin small vessels with the lining membrane of the ventricle. The pineal gland was enlarged.

Morgagni, lxi. 2.

CASE 7.

Insanity from deposition of serum, and induration of the medullary substance.

A waterman about forty years of age became at first hypochondriacal and then insane. His insanity was of a vivacious character, and he continued in this state for ten years. His body then swelled, respiration became difficult, and he died in January 1750.

Dissection. The thorax contained a large quantity of water, and a portion of the lungs was consolidated. When the head was removed from the trunk a small quantity of serum escaped from it. The medullary substance of both hemispheres of the cerebrum was somewhat harder than natural.

Morgagni, lxi. 5.

CASE 8.

Insanity from deposition of serum, and induration of the medullary substance, with flaccidity of the cortical.

A man who was insane, one night evaded his keepers and threw himself from the window. His head struck against the wall or ground, and he died immediately.

Dissection. The inspection of the body was attended by Mediavia. There was no appearance of injury in the cranium or cerebrum from the blow. On examining the brain a little fluid was discovered between the membranes; the lateral ventricles were half filled with it, and in them it was of a

yellowish-red colour. The choroid plexuses were florid, the vessels were turgid in other parts of the brain as well as in the plexuses, and the coats of the arteries unusually firm. But the circumstance most worthy of notice was, that whilst the cortical substance of the cerebellum was exceedingly flaccid, and that of the cerebrum in a less degree, the medullary substance of the cerebellum and the tuberculum annulare was a little firmer than usual, and that of the cerebrum and of the beginning of the medulla spinalis was peculiarly hard.

Morgagni, viii. 15.

In one case of this nature the vessels were found distended, some fluid was deposited beneath the pia mater, and the general substance of the cerebrum was indurated, whilst some of the internal parts were extremely soft: amongst the latter were the fornix and the pineal gland.—12.

The brain has been found indurated by other anatomists. In my dissections the pineal gland often appeared diseased; and in almost all the dissections I have made of persons whose intellectual faculties were deranged, the substance of the cerebrum and cerebellum was unnaturally firm. The membranes of the brain have been thickened, and the falciform process ossified, both in cases of insanity and idiotism. It has occurred to me frequently to find that there had been determination of blood to the head, and more frequently deposition of serum beneath the membranes or in the ventricles. The spleen was probably often affected, and the liver and pancreas have also been found the seat of disorganization.—13, 14.

It must, however, be admitted, that the indurated state of the brain has been observed when there had been no manifestation of a disordered mind; and aberration of intellect has existed without a morbidly resisting quality in the texture of that organ.*—18.

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* Mental alienation has awakened a degree of interest amongst men of science and humanity in some degree commensurate with its peculiarly distressing and humiliating consequences. Examinations after death, however, have not developed any uniformity in the parts affected, or in the nature of the deviation from a healthy state, though some of the encephalic structures are more frequently diseased than others. I shall give an abstract of thirty seven cases from Haslam's observations on melancholy and madness, a work which is well known. In the greater number no mention is made of the pericranium; in about four instances, however, it was firmly, and in seven very slightly adherent to the skull; in one of the latter cases the bone appeared as if it had been inflamed in patches, and in another, as soon as the pericranium was removed from the cranium, to which indeed it scarcely adhered, blood oozed from the parietal bones. The skull sometimes was thicker, at others thinner than usual. It is worthy of remark that the dura mater is not once mentioned as having been particularly diseased, though in about three or four cases it was more closely or more loosely attached to the calvarium than natural. There are a few instances in which it is said that there was determination of blood to the head, and probably the vessels of this membrane partook of the general plethora. The tunica arachnoides almost invariably indicated the consequence of inflammation in the opacity and thickening of its texture. This was variable in degree: in some cases there were only opaque spots—in others there was a diminution of transparency—or slight opacity—or a milky whiteness. In some it was obviously thickened, and in one case to such a degree as to exceed the thickness of the dura mater: in a solitary instance it was blood-shot. The pia mater, in the larger proportion of the cases was suffused; in some of the cases the vessels were dilated, and in three or four the veins contained

SECTION X.

Hydrophobia.

The symptoms in this disease are so greatly diversified, that there cannot but be considerable

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air. In a few instances it was the seat of evident inflammation. Fluid is said to have been deposited "between the membranes," indefinitely, in five or six cases, but it had taken place betwixt the tunica arachnoides and pia mater in at least a moiety of the whole of the cases, and in some of them the quantity was very considerable. When this fluid was subjected to chemical analysis it was incoagulable by heat and acids, but a cloudiness was produced, and when the liquor had stood for some time, there was a slight decidium of animal matter. Some crystals of nitrate of soda resulted from evaporation. In one instance, in which an abundance of serous fluid pervaded the membranes, there was a deposition of a milky fluid between the tunica arachnoides and pia mater on the left posterior lobe, which presented the appearance of a vesication. The convolutions in this case were so large and distinct as to resemble the intestines of a child. The ventricles in nearly an equal number of cases were occupied by fluid from the smallest excess to the quantity of eight ounces. In one of these instances the fluid did not exceed two tea spoonfuls, but was of a deep yellow colour; and it is worthy of remark that the gall-bladder contained one calculus like a mulberry, and another had fallen into the duodenum: the coats of this cyst were thickened. In two or three cases there were hydatids or vesicles on the choroid plexuses; and in a very few others extravasation of blood between the membranes or into the ventricles. The texture of the cerebral substance presented no uniformity of appearance. In several it afforded examples of unnatural firmness, and, in nearly an equal number, of unusual flaccidity. The author states that he but once saw it elastic as well as firm; but he sometimes reports it to have been doughy. Its vessels were often so charged with blood that it might have been pressed out as if from a sponge. Once the middle lobe of the cerebrum had become gangrenous and was beset with fœtid pus. The glandulæ Pacchioni in some of

variety in the appearances discovered on dissection. Maniacal or melancholic symptoms are

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the cases were unusually developed in size and number. In reference to the vascular system of the encephalon the almost uniform character was that of turgescence, and dilatation of vessels was not a rare occurrence; but in one individual the encephalon was nearly destitute of blood. The state of the abdominal viscera is only mentioned in two cases, when it was natural.

Intellectual derangement has been known to arise from spiculæ of bone in the membranes of the brain. There has also been a gradual abolition of the mental faculties from tumours pressing upon this organ. An extraordinary instance of this from fungus hæmatodes developed in the substance of the brain and adhering to the internal surface of the dura mater is related in the Med. Ch. J. for Oct. 1816.

In a man, fifty years of age, who first became the subject of mental derangement and then of hemiplegia, Dr. Duncan, jun. has related that the whole of the right hemisphere of the brain was softer than the left, but the anterior and middle lobes were in a morbid and pulpy state. The surface of the right thalamus nervi optici was covered by a soft pulpy mass, which was easily removable. The left ventricle contained some fluid; the choroid plexus was distended; and some vessels ramifying upon the parietes of the ventricle were very much injected with blood.

Ed. Med. J. No. 68.

M. Rostal has devoted some attention to a state of the brain which perhaps corresponded with that described by Dr. Duncan, and has published eight cases under the title "Recherches sur une Maladie encore peu connue qui a reçue le nom de Ramollissement du cerveau." The symptoms were fixed pain in the head, vertigo, dulness of intellect, treacherousness of memory, and confusion of ideas. The patient becomes morose, peevish, and indifferent to external objects. He has a tendency to sleep, creeping sensations, numbness, often dimness of sight, sometimes delirium, mental alienation, febrile symptoms with extreme agitation, and senile demency. The functions of other organs presented no constancy of symptoms.

Nouveau Journ. de Med. Sept. 1820.

frequently combined with hydrophobia; and Mead and others have reported instances which partook

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Those lesions of the brain from which an imbecile or a perverted condition of the mental faculties results, is often derived from sympathy, with derangement in the abdominal or thoracic viscera. Dr. Burrows, (an able and interesting writer on this subject,) and other authors, have pointed out this relationship in cases of mania, melancholia, hypochondriasis, and all the other species of the disease.

In cases of defect, hebetude, or obliteration of all the faculties of the understanding, various deficiencies of organic structure have been observed. In the bodies of nine idiotic persons, Dr. Cayre found the cerebral and spinal nerves yellow, thin, and wasted; and the great sympathetic, especially its ganglion, was greatly developed. It was, at least, a remarkable coincidence, that in two cases of idiocy examined by Dr. Hastings, the posterior cornua of the lateral ventricles were deficient, so that there was no trace of hippocampus minor. The brain was morbidly vascular; the tunica arachnoides was thickened and opaque, and a serous fluid was effused between that membrane and the pia mater and into the ventricles. A man sixty years of age was the subject of one of these dissections: for some months he had griping and slimy stools, and during the last year diarrhæa and tenesmus. Lymph adhered to the surface of the heart, the pleura was highly vascular, and water existed in the thorax and pericardium. A considerable portion of the coats of the stomach was thickened, with central ulceration.

That form of derangement which arises after parturition, constituting puerperal mania, I believe is always accompanied with a plethoric or inflamed state of the membranes or substance of the brain; and this sometimes exists to the highest degree, occasioning effusion of serum and of coagulable lymph. It is often connected with something wrong in the uterus, but may occur without apparent uterine irritation. Few cases have fallen under my own notice; in two, however, the state of the uterus was unnatural. In one of them this viscus had not contracted so much as might have been expected, and the intestines were inflamed; in the other, which was the last I examined, the uterus was fully

of furious delirium, with greatly augmented muscular strength. Many persons, however, so far from having delirium, do not evince the slightest degree of fever. The circumstance of dreading water whilst experiencing thirst must not be imputed to delirium; nor must it be supposed that all dread water, for some request it might be brought to them, and endeavour, though unsuccessfully, to drink. On some occasions the effort, though made with the utmost caution, has been attended with violent pain: in other instances convulsions have been produced; and it is known that instant suffocation has actually resulted. When persons have been asked why they did not drink, it has usually been ascribed to a sense of constriction of the fauces or throat. At the time that there is this inability to drink, solid food can often be swallowed without inconvenience.—*Morgagni*, viii. 19.

Of persons who died under this disease, several dissections have been communicated to the public, and from such accounts we learn that the fauces and the mucous membrane of the trachea have been found intensely red; and blood has been effused into the cells of the lungs. In others the stomach and intestines have been covered with red spots.

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contracted, but its internal surface was in a sloughing state. The mental affection seemed, however, to have arisen in consequence of the woman's rest having been greatly interrupted by the constant presence of noisy children, and also from the administration of diffusible stimuli by an incompetent nurse. The dura mater adhered firmly to the skull; the tunica arachnoides was opaque, and raised up by a great redundance of fluid; the pia mater was inflamed, and the brain was of an unnaturally firm texture.—*Ed.*

In one dissection Mead discovered nothing more than a large quantity of green and viscid bile in the stomach, although he likewise examined the throat, brain, and thorax. The whole course of the œsophagus has been found in a contracted state. I apprehend, however, that we have not yet had a sufficient number of dissections to determine satisfactorily the seat of the disease: and I lament that from an uncontrollable fatality it has not been in my power to dissect one of these bodies. Either I have not been able to obtain permission, or have been prevented by illness or urgent engagements.

Morgagni, viii. 20, 21.

The first patient I saw at Bologna under this lamentable malady, was a boy who had been bitten in the cheek forty days before the disease commenced. He was furious and anxious; his face was florid; he was extremely restless, but quite sensible, and therefore did not attempt to injure any one. Whenever water was offered to him, a sense of suffocation was produced. Death ensued within twenty-four hours.

In another boy of this place the disease commenced five months after he had been bitten in the leg. The cicatrix ulcerated. He was unexpectedly seized with anxiety, and soon afterwards a dread of water came on. In the morning his lips were black, and his pulse scarcely perceptible: at noon, about twenty hours from the attack, he expired.

I shall subjoin two dissections, undertaken at my request by my friend Mediavia; and will add a third which was transmitted to me by Jaques de Machy from Rome.—22.

Case 1.

A man who had been bitten some months before by a rabid dog, was seized with unequivocal symptoms of hydrophobia. Medicines were administered internally, and water was ordered to be poured upon his head. As he appeared to be a little better, he was directed to go into the bath, and immediately set out thither, begging of those who attended him that he might go in voluntarily. When he came there, however, his courage failed; he was therefore thrown in and held down for some time. The attendants took him out and laid him in bed; he lay quiet, but not long afterwards he became cold, and died the approaching night. This occurred about the middle of September 1723.

Dissection. The body was inspected sixteen hours after death, and though the atmosphere was rather cold for the season the smell was highly offensive. The gall bladder contained a very large quantity of black bile; the lungs were black and fœtid; the right auricle of the heart was extremely dilated, but the dilatation was not owing to what it then contained. Beneath the dura mater there were some bubbles of air; all the vessels of the brain were full of blood, so that the choroid plexuses were black. There was no redundance of serum; indeed the substance of the cerebrum and cerebellum was somewhat dry. The blood throughout the body was rather disposed to concretion than fluidity.—viii. 23.

When the physicians prescribed the affusion of

a large quantity of water, they perhaps had reference to some cases recorded in the volumes of the Royal Academy of Sciences at Paris.

Case 2.

A man who a month before had been bitten by a rabid dog was seized with hydrophobia. He was delirious and feverish, and was continually crying out. Being once immersed in water when it probably was too late, and weakness had come on, he was scarcely taken out before he died*.

Dissection. When the body was examined, twenty-four hours after death, though in the hottest season, at the end of July, it was not very offensive. The face appeared like that of a person emaciated by tabes, whilst the other parts of the body were fleshy. The abdomen was tumid, in consequence of the stomach and intestines being inflated with air. The stomach likewise contained some yellowish-green water, and the vessels ramifying through its coats were greatly distended with blood. A considerable portion of the liver was livid; and the gall bladder was full of bile of a brown hue. The diaphragm was not entirely free from inflammation. The posterior part of the lungs was turgid with blood; and throughout the body this fluid was

* The effects of cold affusion in a variety of diseases have been estimated of late years in this country, but without a satisfactory result. Whenever cold affusion or submersion is employed, we have been urged to regard the state of the patient; for if resorted to when the powers of life have become languid it will probably contribute to abridge the patient's life, as it did on this occasion.—*Ed.*

black. The internal membrane of the upper part of the œsophagus, and the whole inner surface of the pharynx, larynx, and aspera arteria were of a livid red colour, approaching to a gangrenous state; and the pharynx, even to the posterior foramina of the nostrils, was full of frothy mucus, which had a greenish yellow colour. The vessels in the membranes of the brain were exceedingly turgid with blood, and the interior substance of this organ exhibited numerous bloody points and filaments. There was a small quantity of reddish serum in the lateral ventricles.—viii. 25.

Celsus formerly recommended submersion in water as the only remedy for this disease; but the inutility of such treatment, both as a preventive and curative measure, has been shown by many distinguished authors.—26

Case 3.

A strong man, sixty years of age, was bit in the wrist by a rabid dog. The wound cicatrized, and no signs of hydrophobia were discovered till within twenty days of death, when three months had elapsed after the bite. Having been severely bruised by another person, he began to be agitated with unusual and surprising timidity, trembling with fear at every little noise, regarding every stranger as a betrayer, and endeavouring to avoid him. Soon after these symptoms arose he was seized with a dread of light and water, and was brought into the hospital, where he lived two days. His attempt to swallow water occasioned contortions of the body; and though he actually succeeded in

swallowing a portion of that liquid, yet it was a task which he performed with the utmost difficulty. His incredible fear—his aversion to water—and the difficulty and uneasiness he felt on beginning to swallow it, continued to the time of death. The body was opened on the 21st of May 1727.

Dissection. The intestines were greatly distended with gas. There was a thick grey-coloured fluid in the stomach. The gall-bladder contained only a little bile, and that was of a saffron-yellow colour. The iliac veins were so distended with blood as to equal the natural diameter of a small intestine. The lungs were full of coagulated blood, and the posterior part of them seemed as if it were affected with gangrene. The pericardium contained about three ounces of fluid. There was some blood in the heart, which in colour and consistence resembled half-melted black pitch. The organs of deglutition were without any mark of inflammation, except at the upper part of the pharynx, where a slight redness was observable: but the membrane covering the epiglottis was wrinkled. The vessels ramifying through the membranes of the brain, arteries as well as veins, were excessively distended with blood, which, as in every other part, was exceedingly black. The optic nerves were thicker but more flaccid than usual. There were about three ounces of a yellowish fluid in the ventricles of the brain.

viii. 27.

Many persons suffering under hydrophobia are afraid of the agitation of air; and sometimes complain of its being stormy when the utmost calmness

and serenity of weather really exists. If the windows or doors are opened the symptoms are not unfrequently rendered more urgent; nay it occasionally happens that a sense of suffocation is experienced from the slightest breath of air.

In a manuscript of my friend Ramazzini, written nearly fourscore years ago, I found the following particulars of a virgin of Modena. Fifty days after having been bit in the lip by her own lapdog, and when enjoying perfect health and indulging no apprehension of hydrophobia, she was crossing a small rivulet, and gave full proof that she laboured under the disease. Amongst other symptoms she had the sensation of a small stream of air directed against her head, so that she repeatedly entreated that the windows and doors might be closely shut. She cried out from the least motion of the bed; and if any one shook the clothes or offered her a fan she was exceedingly terrified, and was seized with the most violent convulsions. Notwithstanding the horror felt at the idea of water, she was compelled by an attendant to drink copiously of it, after which she became speechless, was tortured with convulsions, and soon died. Ramazzini inferred from this case that neither acute fever nor delirium always accompanies hydrophobia, and that to compel those who labour under the disease to drink or plunge into water expedites their destruction.

The dread of liquids in some cases is so great, that barely mentioning them induces screaming, tremor, convulsion, or syncope. On the other hand, there have been instances of this disease in

which the patient could drink wine: nor in such cases was any shuddering produced by the mention of water. In fact the individuals went into the bath when ordered, and could drink water without difficulty when the first inconvenience of swallowing was overcome.

Much importance has been attached to the external use of water, either in the form of a common bath or by unexpected immersion, as a preservative from the disease. Notwithstanding this practice has chiefly been employed amongst the Dutch, two of their most eminent physicians, Tulpius and Stalpart, are divided in opinion respecting its efficacy. There are almost insuperable difficulties in appreciating the influence of preventive projects. The dog might not be rabid; or, if he were, the saliva might be wiped away upon another person, or by passing the teeth through thick garments: nevertheless, among the multitude of persons that have been preserved from the disease, I cannot persuade myself that none of them had received the infection.—viii. 29.

When the morbid appearances observed on the dissection of hydrophobic persons are compared with each other, it will be found that the differences are as numerous as were the symptoms during life. The fauces, œsophagus, and trachea were inflamed in most cases, but this circumstance was not universal. The state of the brain and vascular system was equally variable with that of other parts.—viii. 30.

Hydrophobia independent of the infection of rabies.

Instances of hydrophobia have occurred without having been preceded by the bite of an animal, in which the morbid appearances of the pharynx, lungs, intestines, and stomach coincided with those which arise from the infection of rabies contagiosa. Two cases of this nature originated from drinking a cold fluid whilst the body was greatly heated. One was dissected by the celebrated Genselius, who found the muscles and glands of the pharynx of a red colour, and the stomach appeared as if it had been dried. The rest of the viscera were in a natural state.

This hydrophobic patient, though he trembled at the light, and at the sight of white linen, and could not endure even to look at some liquids, yet was not distressed at their being named, as it occurred in two other instances. Numerous cases are on record, especially in the observations of Schenck, which, as well as these, shew that true hydrophobia may be brought on without contagion.*—viii. 31.

Though the diversities both in the symptoms and morbid appearances are so great, I consider the principal seat of the disease to be the brain and nervous system. As, however, effects only are

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* There is no reason to suppose that rabies contagiosa is ever spontaneously generated in the human body, or derived from any other source than contagion. The cases referred to being characterized by the water-dread may be regarded, however, as a simulation of that disease.—*Ed.*

visible, and those variable according to the different stages and degrees of violence of the disease, more dissections, carefully and minutely conducted, are requisite to confirm or disprove what has been stated on this important topic.—viii. 32.

A question might arise, whether the flesh of an animal affected with canine madness would induce the disease on being eaten. The flesh of a sow which died rabid is said to have been eaten with impunity; yet, on the other hand, the blood of a person labouring under the disease, which had been lapped by a dog, rendered the animal mad.

All that has been said on this subject may not be credible; but it is proper for those who dissect the bodies of persons who laboured under this disease, to be extremely cautious not to prick or cut their fingers; neither should they expose any small ulcers to the contact of blood nor of any other fluid of the body. On such occasions it is much better to be excessively cautious than to be needlessly unguarded.—*Morgagni*, lxi. 12.

Case 4.

*Feline Madness.**

This case does not directly relate to hydrophobia, but to an affection which bears some

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* It will be observed that I have borrowed this designation from Good's Nosology. Mr. G. under "Anxietas à morsu felis iratæ," (p. 355) has quoted the case, and has referred to another which terminated fatally on the first paroxysm, in the Trans. Med. Soc. of London, vol. 1. p. 78—*Ed.*

affinity to it; and it embraces many particulars apparently of a similar nature.

A cat, fearful that a whelp would injure one of her young kittens, ran to encounter it. The master took up the little dog, when the enraged animal seized her master's legs with her teeth and claws, and wounded him a little above the anterior part of the tarsus. For three days he neither felt nor apprehended any unpleasant consequences, as the cat had no symptom of madness. But on the fourth day he was seized with intolerable anxiety at the præcordia, and applied to the physician, who related the circumstances to me; and this physician at the first interview observed such an expression in the eyes and countenance that he feared madness was at hand. Local and general bleedings were employed, without any good effect. Slight delirium came on. The season was warm, and the only remedy by which his anxieties were relieved was a bath, into which he voluntarily threw himself as often as the anxiety became urgent. At length he had a severe accession of fever, which however, was of short duration. But he perspired greatly, and seemed to be quite restored to health on the fourteenth day after the bite. At every full moon, however, the bitten part was irritable, and the circumference had a livid aspect; the irritation appeared to ascend to the præcordia, and then brought on great anxiety, which, in this stage of the disease, was relieved by bleeding. He was subject to this recurrence for two and twenty months, when they began to return at every fourth full moon only, and this they

continued at the time the letter containing this case was written.*—*Morgagni*, li. 14.

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* Since the time of Morgagni the bodies of numerous hydrophobic persons have undergone minute investigation; but unhappily the result has not yet been such as to afford any greater confidence of mitigating the heart-rending symptoms which distinguish this disease, or such as to excite any expectation of averting its speedily fatal termination. This, perhaps, is the most justly dreaded of any malady to which the human body is exposed; and no practitioner merits the satisfaction of a peaceful mind, after the unsuccessful discharge of his professional duty, if he voluntarily resort to temporizing and useless expedients when he might extirpate the bitten part.

It will not be compatible with my present undertaking to extend my remarks further than pointing out the general features of the cases alluded to; and in doing this I shall pass over the symptoms. Unfortunately they have been so often and so touchingly delineated, that to recapitulate them would be a work of supererogation.

The time at which the symptoms of canine madness occur is extremely uncertain. There are insulated but strongly characterized instances in which their onset was observed within fourteen days of the bite, but those who have most frequently witnessed the disease, place their occurrence at a more distant period. The disease appears seldom to arise earlier than three weeks, and in most cases the intervening time exceeds this period, and extends to an indefinite term of weeks, months, or years. It will, however, be found to have transpired most frequently before two or three months have elapsed; but as far as we can rely on phenomena which pass under observation, and which associate the hydrophobic symptoms with a previous and suspicious bite, some years have glided away between the insertion of the poison, and the consequent disease. Morgagni alludes to the term of twenty and even forty years, but these statements must be received with great distrust.

Occasionally this affection discovers itself before irritation completely ceases in the injured part, when as a precursor of the secondary disease the morbid action increases, and is

SECTION XI.

Aphonia and Paraphonia.

A loss of voice or a depraved state of that faculty, often arises from disease in the larynx, the

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propagated in the course of circulation. I may elucidate this by referring to a case related by Mr. Webster. A man was bit in the hand July 21st. He never entirely lost the sensation of pain in the part. On the 16th of August the pain became more severe, gradually extended up the arm to the shoulder and breast, and on the 19th the arm was immoveable. He was first visited by Mr. W. on the following day. The pain was excruciating, small cicatrices of a red colour were observable on the hand; and the man was unquestionably labouring under hydrophobia. Though comparatively of rare occurrence, there have been instances in which after complete cicatrization, and the entire cessation of excitement, the scars have again become inflamed, and the inflammation has been accompanied with itching and pricking sensations. In the generality of cases the wound has completely healed, and has ceased to awaken the least attention; and though sometimes a degree of redness comes on, in most cases there is no such premonitory token, or it is so slight as to elude observation. To this point, however, great attention ought still to be directed, for were it possible to determine only the frequent occurrence of this intimation, some hope may be entertained, that by timely interposition the horrible distress, and the melancholy catastrophe which otherwise await the unfortunate individual may after all be averted.

On examination after death, no uniformity has been observed in the morbid appearances. In most cases there are striking marks of cerebral congestion; the vessels are loaded—indeed sometimes gorged with blood. The tunica arachnoides has occasionally been inflamed and thickened, and a redundance of serum has been found pervading the surface of the brain and distending the ventricles; and bubbles of air have been found blended with it. The structure of the brain is often exceedingly firm. The mucous membrane of the larynx, trachea and bronchia,

trachea, the lungs, or other organs. After protracted hoarseness Spigelius found the whole

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as well as of the pharynx and œsophagus present more constant appearances of augmented vascularity. This appearance has varied in degree; sometimes representing a slight blush of inflammation, at others the inflammatory action has been more conspicuous, but with equal if not greater frequency it has borne the aspect of congestion of blood, appearing, from the lividness of colour, as if the affected parts were verging to gangrene. The œsophagus has been found in a contracted state, and this tube as well as the trachea, has been observed to be destitute of its natural moisture. An unusual prominence has been noticed in the papillæ of the tongue. The lungs are often the seat of excessive congestion of blood, and the pleura is occasionally inflamed. The heart is sometimes enlarged, and its vessels appear in a state of turgidity. The inner coat of the stomach frequently exhibits a plethoric condition of vessels with numerous spots which seem to be owing to extravasation of blood; the rugæ being large and prominent. In this state of increased vascularity the diaphragm has not unfrequently participated. The liver and other viscera have occasionally presented indications of similar disorder, which might indeed be expected under such exquisite nervous susceptibility, such mental perturbation, and such vascular excitement as are associated in this disease. The inequality in the distribution of blood is often denoted by the comparative state of the larger vessels after death, some of them being loaded with blood when others are empty. It is a circumstance worthy of notice that in many of these bodies, putrescence occurs soon after death.

The infection is usually imparted by the bite of a dog or cat; in India the jackal is also an agent of its propagation. M. Breschet is reported to have communicated the disease to a dog by inoculating him in the neck with the frothy saliva of a man under hydrophobia. Morgagni believed that the disease had even arisen from the virus having only fallen on the human skin, but this is scarcely credible.

Symptoms which greatly resemble those of rabies contagiosa have arisen from moral impressions. An anecdote is related by

internal surface of the trachea in a state of inflammation and of a black colour. The voice will be modified by roughness in the rima glottidis; by disease or defect in other resonant parts, as the nostrils and palate; and by relaxation of the fibres of the glottis. Two of the following observations relate only to that aphonia which succeeds lesion of the brain; and the affection appears to be of a nature between apoplexy and paralysis. The patient is insensible and speechless, but not deprived of motion, nor is he convulsed. The third appeared to be an affection of a sympathetic species.—*Morgagni*, xiv. 33, 34.

Morgagni which shows how powerfully the mind may be agitated, even where the intelligent and professional character of the individual would have forbidden the expectation of such an occurrence. Alberto Fabbri who was the first physician in Bologna a little before Morgagni's time, was seized and strongly held by one hand, by a patient labouring under hydrophobia, while he was feeling the pulse with the other. He became so extremely dejected, as scarcely to command his reason, and the idea of self-destruction often occurred to him. For seven days he had abstracted himself from society when his attention being rivetted through perpetual gloom, he was wetted to the skin under a heavy shower previous to his being conscious of it. The place was solitary, and before he could obtain shelter his melancholy was washed away. It is probable his imagination was influenced by a reliance on the efficacy of a sudden and unexpected profusion of water in averting hydrophobia. Here certainly no hydrophobic symptoms had arisen, but in other cases, from equally unwarrantable grounds, they have been developed; and perhaps but for the propitious shower, a modification of them, at least, might have been the destiny of Fabbri.—*Ed.*

Case 1.

Aphonia from serous effusion after inebriation; with ulceration in the stomach, and small fleshy tumours in the intestines.

A husbandman of middle age, and of spare habit of body, was seized with aphonia when intoxicated. When brought into the hospital he was scarcely able to move his head. On the fourth day after his debauch, his pulse was slender and declining, and he yielded to his fate without being convulsed. This circumstance transpired about the end of February 1737, and his body was brought into the college for dissection.

Dissection. On the internal surface of the stomach, at its fundus, some black spots resembling the larger granules of tobacco were observed, which on attentive examination I perceived were incipient marks of mortification; and in another part there were small spots of ulceration. I had seen appearances like these, however, in the stomach, œsophagus, and duodenum of a woman whose manner of life and last illness were of a nature quite different from the habits and death of the husbandman. Within the beginning of the intestinum ileum there were one or two small prominences like the point of a little finger. They were of a reddish hue, but their texture was not glandular.* A small portion of the cæcum was

* These tumours seem to have been of the nature of the "milt-like tumour of the mucous membranes" described by Dr. Monro in his morbid anatomy of the human gullet, &c.—*Ed.*

of a red colour, and this was the case also with a larger portion of the rectum. The liver was somewhat pale and indurated, and the gall-bladder contained some viscid bile of a pale green colour. The coats of the urinary bladder were rather thickened. The heart had a little fat upon it; and the valves which are placed at the venous orifices of this organ were considerably thickened and indurated, and were of a whitish colour. The internal surface of the aorta exhibited some of those opaque spots which precede ossification.

The vessels of the pia mater were rather turgid with blood, and beneath this membrane a limpid fluid was deposited, which was pervaded by numerous bubbles of air. The lateral ventricles were occupied by a considerable redundance of this pellucid water, and the choroid plexuses were pale. The general texture of the brain was firm, but the medullary substance beneath the fornix, and also the nerves, were extremely flaccid.

Morgagni, xiv. 35.

Case 2.

Aphonia from extravasation of blood, and deposition of serum in the brain after inebriation.

A servant man about sixty years of age, addicted to drinking, had been brought into the hospital on account of aphonia from inebriation, but he left the following day in good health. He was afterwards brought in again from the same cause. He vomited a large quantity of wine, but never spoke from the time of coming into the hospital. He was attacked with violent fever, lost the power of motion and

the sense of feeling in the left arm, and died on the fourth day, March 14, 1756.

Dissection. As soon as the head was severed from the body a large quantity of unusually dark blood flowed from it, so that when the calvarium was removed, the vessels of the pia mater did not appear distended with blood. The right lateral ventricle was occupied by a large quantity of fluid, the plexus was of a pale colour, and there were numerous though small hydatids upon it. The left ventricle contained a much smaller quantity of water, and there were fewer hydatids upon its plexus. In the right hemisphere of the cerebrum there was a cavity filled with extravasated blood, which was equal in extent to the bulk of a walnut. It occupied a part of the corpus striatum and optic thalamus. The thorax and abdomen were not opened.—*Morgagni*, lxiii. 13.

Case 3.

Aphonia from spasm, connected with derangement in the digestive organs.

A nobleman, Count Alexander Monsignani, sixty years of age, of slender form, subject to bilious affections, to strangury, gout, and hemorrhoidal fluxes, but from all which affections he had become apparently free, was seized about the beginning of May with inability to speak, attended with some difficulty of respiration and with a sense of constriction about the larynx. The aphonia suddenly came on, and as abruptly ceased, without any excretion. The periods of attack and duration were variable. Its

continuance did not exceed two minutes, and often it was even more transient. He had an attack almost constantly about one o'clock in the morning, and it sometimes occurred in the day. Indeed whenever he drank wine, and sometimes when he gaped, sneezed, or coughed, he was invaded by this affection.

When seized he could take nothing into his mouth, nor rest in one place, but was constrained to walk about. The tonsils were slightly inflamed, and there was a copious discharge of acid humour by spitting. It appeared probable that the investing membrane of the larynx and adjacent parts, (being morbidly sensible from the existence of slight inflammation) was a little irritated by the particles of wine, or the acrid secretion brought into contact with it during those acts which have just been particularized, and sometimes from its excess in quantity, and this irritation excited a sympathetic action in the muscles, by which the larynx was constringed. There seemed also a greater susceptibility of this spasmodic action, from the hypochondriac affection, which had been indicated by the hæmorrhoidal flux. This supposition was confirmed by the event, for having gently purged the alimentary canal, and sparingly abstracted blood first from the arm and afterwards from the anus, using diluent medicines at the same time, he passed several nights without his usual annoyance. He was then advised to take a short journey, and with this advice he complied. The sputum decreased in quantity, and became less acid; he could bear a little wine and water, and about the fortieth or

fiftieth day from the commencement of this plan the affection was entirely removed.*—*Morgagni*, xiv. 37.

* One of the most affecting species of congenital imperfection is deafness with its consequent speechlessness. The vocal powers may be impaired or destroyed by lesions in the organ of voice itself, or in those organs which are tributary to it; but sometimes the impediment originates from a distant source. Of the former description are inflammation and thickening in the membrane of the larynx, effusions of lymph, deposition of fluid in the cellular tissues, ulceration, excrescencies, enlargement of the glands, and foreign bodies, as well as the different diseases to which the cartilages are liable. The same effect may be occasioned by the trachea being compressed by tumours or other affections of the adjacent parts. Of the remote causes of injury to these organs, perhaps the most frequent are those lesions of the brain by which the influence of the nerves is usually destroyed, so that aphonia, or an inability to control the motion of the tongue, has been a frequent precursor of apoplexy, paralysis, epilepsy and similar affections: but at other times there has been aphonia from paralysis of the tongue exclusively. An unnatural performance of the digestive functions induces a state of the nervous system well known as a fruitful source of local disease, and local irregularity of action. A suppression of habitual hæmorrhages has given rise to derangement and even extinction of voice. Over-exertion has a tendency to circumscribe the range of this faculty. M. Portal has related the case of a celebrated Italian singer who after two months severe exertion of the voice found it become somewhat more bass; when she was required to sound all the notes distinctly, beginning from below, an obstacle to the full ascent was clearly distinguished. She had become plethoric. Bleeding and blistering were resorted to, but six months elapsed before she was able to resume her engagements at the theatre. He has also reported an instance in which the voice of a thin, lively, and irritable woman was so peculiarly irregular that it was ascribed to witchcraft. Loss of voice has also resulted from overwhelming passions, but when this has been the cause the effect has seldom been permanent. Dr. Serres has related a case of aphonia with injury of all the senses which was produced by the wind of a cannon-ball.—*Ed.*

SECTION XII.

Diseases of the Eyes.

Amaurosis.

Sometimes amaurosis has originated from convulsions, and has disappeared on their cessation. It has ensued from a wound above the supercilia, in consequence of injury done to the ophthalmic branch of the fifth pair of nerves as it passes out from the orbit. The optic nerves have been compressed, and amaurosis produced, by a turgid state of the vessels which internally and externally accompany the substance of these nerves. It is supposed that to this cause are to be referred those cases of amaurosis which succeed phrenitis and similar affections of the head, and those instances of women, recorded by Rolfinc, who as often as they were pregnant were always blind till the time of delivery. It has also arisen from disease and extenuation of the nerve. Compression of the nerves and consequent amaurosis have likewise been occasioned by strumous and other tumours, as well as by hydatids, and hydrocephalus. A fungous excrescence has also been found upon the point of union of the optic nerves, and from this cause blindness resulted.

It sometimes happens that when disease has arisen in one of the optic nerves, both eyes have been affected, but this is not a necessary consequence. We have no proof that there is any commixture or decussation of substance where the nerves unite. Vesalius and others have found the nerves separate in their whole course. Santorini

met with the optic nerve of a blind eye more slender than the opposite and also discoloured, from the orbit quite to its origin; and these appearances continued on the same side. Other authors have described similar morbid occurrences.*

Morgagni, xiii. 5—7.

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* The brief sketch of amaurosis at the head of this section embraces only a reference to some of the structural and functional causes of this imperfection of vision; and we might add that it is often a sympathetic affection. Mr. Travers in his excellent Synopsis of the Diseases of the Eye, enumerates three species of causes which produce *organic* amaurosis. "1. Lesion, extra-"vasation of blood, inflammatory deposition upon either of its "surfaces, and loss of transparency of the retina. 2. Morbid "growths within the eyeball, dropsy, atrophy, and all such dis-"organizations as directly oppress or derange the texture of the "retina. 3. The state of apoplexy, hydrocephalus, tumors or "abscesses in the brain, in or upon the optic nerve or its sheath, "and thickening, extenuation, absorption, or ossification of the "latter." He adduces two species of causes which produce *functional* amaurosis. "1. Temporary determination, vascular "congestion or vacuity, as from visceral or cerebral irritation; "suppressed or deranged or excessive secretions, as of the liver, "kidneys, uterus, mammæ and testes; various forms of injury "and disease and sudden translations of remote morbid actions. "2. Paralysis idiopathica, suspension or exhaustion of sen-"sorial power from various constitutional and local causes; from "undue excitement or exertion of the visual faculty; and from "the deleterious action of poisons on the nervous system, as "lead, mercury, &c." p. 140.

It is rather a curious circumstance that the optic nerve has been rendered completely insensible for some days, under the continued use of squills, and also of digitalis, conducted by gradual increase to rather a full dose. Amaurotic affections have also arisen subsequent to the venereal disease; and they have been brought on by partial exposure to cold, as for instance by looking out at a window. Amaurosis has likewise occurred as a congenital family imperfection.—*Ed.*

Case 1.

Disease in the coats of the eye and in the optic nerve.

A man from Tuscany was almost destroyed by a very large and fetid ulcer of the leg, and on this account he obtained admission into the hospital, where he died about the middle of January 1740.

Dissection. While dissecting the head for other purposes I perceived that the man had been blind in the right eye, but I could not ascertain the date of his blindness. The left eye was in a natural state; and no vestige of any previous wound could be discovered. The muscles of the diseased eye were pale, and the ball of the eye was greatly diminished in bulk. The anterior surface was white, and exhibited no trace of the cornea; but it was divided into three small protuberances. These prominences, as well as the greater part of the remaining substance of the eye, consisted of the tunica sclerotica, which was indurated and thickened in consequence of its contraction. This coat included the choroides, which was equally contracted, and was moist; but all the other coats and humours either were absorbed or had escaped. The optic nerves being exposed both in the orbits and within the skull, appeared widely different from each other. Whilst the left was in a natural state, the right was of a cineritious colour, and greatly extenuated. From the eye to a little beyond the breadth of a finger, it contained nothing of nervous substance, but a grey, turbid, and glutinous humour; and when this humour was squeezed out, the coats of the nerve were found to be much thickened.

The remainder of the nerve to the point of union with the opposite, was of an ash colour both externally and internally, and was evidently slender. From the point of union, however, both nerves presented a natural appearance.—*Morgagni*, xiii. 8.

Whilst examining the brain of a man who died in this hospital, I found that the right optic nerve was attenuated and of a cineritious colour from its junction with the left even to the orbit, yet this person had not been blind in either eye.

Morgagni, lxiii. 8.

Case 2.

Ossification of the retina.

In a man who had been blind in one eye from birth, and who was killed by a blow on the head, the eye presented the following appearances. The adnata was crowded with vessels. The cornea was opaque, and much smaller than usual, and did not retain its wonted figure. The ball of the eye too was considerably less than the natural size, and was not spherical. When it was divided a blackish fluid escaped; but no vestige of vitreous or crystalline humour was discoverable. The tunica sclerotica was contracted; and the uvea was adherent to the choroides: but we could not distinguish the iris or the corona ciliaris. Beneath the tunica choroides, instead of the retina there was a thin bony lamella, which, proceeding from the insertion of the optic nerve, was entire, and preserved the figure of the eye. It extended quite to the circumference of the organ; and there it adhered more closely to the uvea than to any

other part, and within it was contained the black humour.

The difference between the optic nerves was instantly apparent. On the opposite side the nerve was in a natural state: on this it was depressed, thin, and of a pale fleshcolour. From the eye to the point of conjunction it bore greater resemblance to an artery than to a nerve, in consequence of its coats being contracted and thickened, and from the circumstance that the caliber was occupied only by a kind of mucus. From the point of union both nerves appeared in a natural state.

Morgagni, lii. 30.

This is a very rare occurrence. Haller said that he had read of the lens being found bony, but he did not know that ossification of the retina had ever been observed.*—31.

Case 3.

Ossification of the crystalline humour or its capsule.

Whilst dissecting the head of a woman, I found that the left eye was not larger than the right in the forementioned native of Tuscany, but it was somewhat less diseased in structure. The cornea was not wholly opaque. It appeared spotted and brown, in consequence of a portion of the iris adhering to it, and occasioning the appearance of

* Ossification of the retina must still be regarded as of exceedingly rare occurrence. Nothing could render this more certain than the circumstance that the instance related by Morgagni is the only one to which Mr. Travers has referred. Indeed the formation of bone in other tissues of the eye has been observed but very seldom.—*Ed.*

greater disease in it than really existed. The tunica sclerotica was contracted and thickened, and the choroid coat adhered to it more closely than usual. Subjacent to the choroides was a thick, firm, and whitish membrane which proceeded forwards, and covered that part of the eye where the corona ciliaris and crystalline humour are usually situated. It was doubtful whether this had been the retina, or the membrana hyaloidea, or both together, previous to its becoming so thick. In this eye, however, there was neither crystalline nor vitreous humour, but only a few drops of a turbid and brown fluid. Adjacent to the natural situation of the lens I found a small hard body, not differing much in its magnitude and figure from the lens, though a little larger. It was convex anteriorly, and concave posteriorly, so as to exhibit a miniature representation of a shield, and principally consisted of a moderately thick, but not a continued osseous lamina. Part of the remains of the uvea adhered very closely to the anterior surface of this body, whilst the concave surface was invested by the white membrane already described. When the optic nerve was traced, it was observed to be more slender than the right, more compact in substance, and of a brownish colour, from the eye to the point of coalition. The right did not deviate from its usual appearance; and indeed from the point of union both were equally natural.—*Morgagni*, xiii. 9.

It was not easy to determine whether this small bone was formed by ossification of the anterior surface of the crystalline humour, or of its capsule.—10.

Case 4.

Partial absorption of the crystalline humour in sitû.

The eye of an aged woman was brought to me during the public demonstrations of 1747. Its figure was not so spherical as is natural to that organ; and as the greater part of the cornea was opaque from white spots, it was evident that she had been blind in this eye. The tunica choroides adhered more closely to the sclerotica than usual, particularly at the posterior part. The anterior surface of the crystalline humour was unequally excavated in the middle, and that to a considerable depth; the remainder of the humour might be considered as of a sound texture for the woman's age, though when held towards the light it resembled yellow amber. The iris was partially adherent to the cornea, but most intimately at the centre, where the cornea was unequal, and one of its lamellæ was beginning to separate.

Morgagni, lxiii. 2.

Case 5.

Dislocation of the crystalline humour and its absorption in the anterior chamber, with disease in the retina and optic nerve.

The cornea of a man's eye had long been opaque, and there were slight but unequivocal traces of a double cicatrix upon it. The crystalline humour was connected with the cornea: it was not hard, but so reduced in quantity that scarcely a fourth part of it remained. The uvea was not greatly diseased, but the vitreous humour and retina were

in a much worse condition. The optic nerve had become exceedingly slender, and instead of containing medullary matter, the whole interior structure of the nerve within the orbit consisted of a whitish and very compact substance. The state of the nerve within the cerebrum I had not an opportunity of ascertaining.—*Morgagni*, lxiii. 4.

Case 6.

Blindness after smallpox, from disease in the lens, &c.

I dissected the eye of a man who became blind from smallpox at an early period of life.

On puncturing the back part of the tunica sclerotica, a quantity of limpid water immediately escaped. The remaining part of the vitreous humour remained attached to the crystalline as usual. The lens was small; and in the centre of its anterior surface it was opaque and soft; and when cut into perfectly limpid water flowed out of it. Having divided the residue of membraneous tissues, both sections exhibited a series of extremely minute blackish particles, carried directly through the middle, from one extremity of each section to the other; whereas in other parts the colour was of a faint whiteness. The coats of the optic nerve were thickened within the orbit, and the medullary substance was unusually moist; but within the cranium the nerve was in a natural state.

Morgagni, lxiii. 6.

Case 7.

Confusion of vision from paralysis in the muscles of the eye.

A priest who for some time had been troubled with an eruption on one or the other cheek, was suddenly affected with such confusion of sight that when he directed his eyes downwards to read, as we usually do, the letters appeared to be crowded one upon another, and in a degree to decussate. But this confusion was immediately removed by shutting one eye, or by placing the book directly opposite both eyes when they were not directed downwards, and even if they were turned upwards. Some disorder however remained if the book thus placed was transferred a little to the right side, but not when it was removed to the left. I was consulted respecting this case by letter, and from the history given of it there appeared to be a defect in the actions of the right abductor muscle, and in the adjacent depressor, so that if the eyes were directed downwards, or turned to the right side, they were moved unequally, and the letters consequently appeared doubled and placed upon one another. I conjectured that there was slight paralysis in these two muscles.

Sometimes I have known a muscle become adherent to the nearest immoveable part, so that it has been rendered incapable of its natural action. If any of the muscles are too long or too short—if they are too detached or too confined in their motions from birth, a proportionate degree of strabismus will be the consequence.

Morgagni, xiii. 20.

Muscæ volitantes.

The eye is occasionally annoyed by an appearance of gnats or atoms, and these have been considered as indicative of the approach of cataract. I have not hesitated to express a belief that this may arise from some injury done to the cells of the vitreous humour, from lesions of the optic nerve or retina, or from dilatation of the vessels which ramify through this nervous expansion.*

Morgagni, xiii. 14.

Case 8.

Pterygium.

Some years ago I had an opportunity of witnessing this affection in a man forty years of age, who had the disease in both eyes, and who came to consult Jerom Vandelli at Padua. It commenced in his youth, and had extended to the middle of the cornea. The membrane arose from the inner

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* Mr. Travers entertains the opinion that when muscæ are *fixed* there is "probably a deposite or extravasation between the "choroid and retina compressing to a certain space the papillæ "of the retina to which the musca corresponds in figure." The *floating* muscæ he considers "altogether as a functional affection "not interfering with useful vision and sometimes though not "often removed." p. 177. They appear to consist of a morbid condition of the vessels of the retina; and are generally induced by over-exertion of the eye, by anxiety or depression of mind, or are derived from a loaded or irritated alimentary canal. Turgidity of the ophthalmic vessels sometimes exists without observable plethora in the head, but at other times this state of the visual organ is combined with a similar condition of the encephalon.—*Ed.*

canthus of the eye by a broad basis, and extended to a point in the cornea, so that it had a triangular figure. It did not adhere much to the adnata in any part, but in the centre it was completely disjoined from it, so that Vandelli passed a probe of moderate size between them with facility; but the extreme point was firmly connected with the cornea, and when the patient turned his eye to look at objects on one side of him the whole pterygium was rendered tense, and the lachrymal caruncle drawn forwards and elongated. Nearer to the basis, it was proportionably less changed from the natural appearance: in this part it was florid from the vessels distributed upon it, but the other parts of it were of a whitish colour.

In consequence of the structure being opaque, a considerable portion of the rays of light were intercepted. The patient indeed was affected with a degree of nyctalopia, for he saw better when surrounded with a degree of gloom than when exposed to a clear light, consequently he saw more perfectly in the evening than at noon. I believe this was attributable to the iris having been accustomed to dilatation from the perpetual obstruction to the rays of light. He did not suffer much pain, nor experience any considerable impediment to the movement of the eye.—*Morgagni*, xiii. 25.

Diseases of the lachrymal ducts.

The most frequent and obstinate causes of lachrymation or watery eye, consist in the compression, obstruction, or coalition of the lachrymal ducts, and these deviations form the natural state

I observe not unfrequently when demonstrating the internal parts of the nose. In a case in which a calculus had formed in the caruncula lachrymalis the overflow of tears arose from the puncta lachrymalia being removed from contact with the eye; and the small canals proceeding from the puncta were also compressed.—xiii. 26.

In a dropsical man I found the duct obliterated on the right side; and in a woman who died of fever the puncta lachrymalia in both eyes were closed. In another instance one of the puncta and its small canal, with the whole duct were not only obstructed but converted into a solid ligament. Sometimes when the duct is impervious, the small canal and the sac are dilated. —*Morgagni*, xiii. 27.

Foreign bodies.

In an inflammation of the cornea and other parts of the eye, it is of great moment to ascertain that irritation is not kept up by any foreign body. I shall relate two instances which show the importance of attentive investigation on these occasions.

Case 9.

Inflammation of the cornea from a particle of iron.

A miller was brought to me with a disease of the cornea, which was supposed to be the result of violent ophthalmy. I observed in the middle of it a small circular spot, whitish in its circumference, and almost black in the centre. He was aware that in chipping a millstone something had flown into the eye, but believed that it was immediately washed away by the tears. I brought a magnet of

moderately attractive powers near the eye, and discovered that the central spot consisted of a small particle of iron, but I could not remove it; and as it gave pain I prescribed bleeding and purging, intending to repeat the application of the magnet at a future period. These measures were adopted, and it was not long before the particle of iron was washed from the eye by the tears, after which the symptoms vanished.—*Morgagni*, xiii. 21.

Case 10.

Inflammation of the cornea from the wing of a fly.

A much slighter cause induced a more protracted and dangerous ophthalmy in Thomas Mangelli, a relative of my own. His physicians and surgeons believed that an ulcer had formed in the cornea from inflammation, and a variety of internal as well as external measures were adopted, but without the least advantage being derived from them. At length one of the surgeons discovered the wing of a small fly in the bottom of what had previously been considered an ulcer. The patient recollected that an insect had flown into the eye a little before the inflammation commenced, and that it had been killed by the application of his hand. The wing had remained closely applied to the cornea, where it brought on inflammation; and the circumjacent swelling represented the lips of a small ulcer. As soon as the foreign body was removed the eye recovered without any cicatrix. *

Morgagni, xiii. 23.

* In the thirteenth epistle, from which most of the preceding observations are taken, Morgagni has recorded some cases of

SECTION XIII.

Diseases of the Ear.

As Valsalva and myself have published more on the diseases of the ear than of the eye, fewer observations remain for publication.

Case 1.

Caries of the petrous portion of the temporal bone, from small pox.

A boy was afflicted with a disease in his right ear, as a sequel of small pox. When he was about twelve years of age, being deaf on that side, and having purulent discharge from the meatus, a

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cataract, but there is little in them worthy of citation. In a few of these instances the disorganization of the eye was such that the opaque lens was dislodged from its capsule, and was situated in the anterior chamber of the eye, where it had been nearly absorbed. It does not appear that he was aware to what extent absorption may be carried on, when fragments of the lens are placed within the solvent action of the aqueous humour. Nor is there any evidence of his having had an idea that the process he described would conduce to the removal of the disease, if there existed no lesion of the organ besides opacity in the lens. He mentions a family in which three sisters were affected with cataract, whilst three brothers were exempted from the disease; and he alludes to a similar occurrence relative to deafness. Some observations on diseases of the palpebræ are also brought forward; and amongst them he relates that whiteness of the eyelashes has appeared to be injurious to vision in a bright light. An example, he says, is extant in the works of Caspar Hoffman, of a person whose eyelashes were white, and who saw better whenever they were painted black. Within his own knowledge, men whose eyelashes had been white from birth, uniformly became blind.—*Ed.*

swelling arose behind the external ear, from which, when the integuments were divided, a large quantity of pus was discharged. Some hours after the abscess had been opened the boy was seized with convulsions, and they recurred at intervals till his death. On the day that he was attacked with these irregular muscular actions, the divided integuments became painful, and a particular part of the incision was so exquisitely sensible that the slightest touch on that spot gave intolerable pain. The day following the boy was delirious, and almost destitute of pulse and strength. His delirium afterwards ceased, and he regained some vigour and cheerfulness; but he relapsed, and died the beginning of February 1740.

Dissection. The lateral sinuses of the dura mater were full of blood, with which also the vessels of the pia mater were surcharged. There was a small redundance of serous fluid in the right lateral ventricle, and a much larger quantity in the left. The sella tursica was occupied by a purulent fluid, some of which had descended to the beginning of the medulla spinalis. The posterior surface of the petrous portion of the right temporal bone was carious, and it was in consequence of a perforation in that bony process that pus had been effused into the cranium. The membranes of the cerebellum on the right side were ulcerated, and the corresponding part of the cerebellum itself to the depth of an inch was of a brown colour. The pus within the cranium had a greenish hue, but was not fetid. The heightened sensibility at a particular point in the incision appeared to have

arisen from a very slender nervous filament which had been pricked but not divided.

Morgagni, xiv. 3.

The following case is of the same nature as the preceding, and was communicated to me by Mediavia.

Case 2.

A youth had a fistulous ulcer of long standing above the right mastoid process. Injections thrown into it partly returned by the meatus auditorius; nevertheless he retained the power of hearing. He was admitted into the hospital on account of an accession of febrile symptoms. His fever increased so that in a few days he had confusion of intellect, with a tendency to coma; and in this state he died.

Dissection. All the vessels of the brain were turgid with blood. There was much greenish water in the lateral ventricles; and to the bottom of the right ventricle pus of a similar colour had subsided. A much larger quantity of purulent matter was discovered between the dura mater and the petrous process of the temporal bone, whence it had found its way into the vertebral canal. This process was the seat of caries, and rather a wide aperture had been made in its posterior surface. The cavity of the tympanum was filled with pus. The brain was moderately firm; but although it was dissected the day after death, it exhaled so offensive an odour that the examination could not be pursued.—*Morgagni*, xiv. 5.

Perforation of the membrana tympani and removal of the ossicula.

In a woman who had not experienced more than dulness of hearing, Valsalva found the membrana tympani on both sides either totally or nearly destroyed by ulceration. On one side all the ossicula were thrown off, except the base of the stapes; and on the opposite side, the incus was disjoined from the stapes. A similar occurrence was observed by Vieussens. If, however, after the rupture of the membrana tympani, the stapes be removed, not only will the tympanum be exposed to injury, but the delicate membranes of the labyrinth will also be laid open to detriment, through the fenestra ovalis. I never read of any person who preserved his hearing long after the stapes had been removed. Although the membrane of the tympanum is not essential to the faculty of hearing, it is requisite to protect those parts which are essential to this faculty, as the labyrinth, for instance, whose fenestræ it shields from mischief. When these delicate parts are exposed to external impressions, it is almost an inevitable circumstance that in the process of time hearing will be destroyed. If this did not happen to dogs in which the membranæ tympanorum were lacerated by Valsalva and others, it was because the injury had been repaired.

It must not be objected that those persons who have a foramen in this membrane, and can impel the smoke of tobacco through it, are not subject to these consequences, because very few cases are

well authenticated, and respecting those that are, we have but little satisfactory information as to the precise duration of the foramina without the faculty of hearing being lost. In some of the cases, too, the aperture might be exceedingly minute.

Morgagni, xiv. 10.

Ossification of the membrana fenestræ ovalis, and other causes of surditas.

Where there is much accumulation of impacted cerumen, it is usually preceded by deafness from a cause that is more deeply seated, and on that account the meatus had been neglected. I observed this on an occasion when there was ossification of the small membrane which connects the basis of the stapes with the fenestra ovalis. The cerumen, after long continuance in the meatus, has sometimes acquired the hardness of stony matter.—*Morgagni*, xiv. 11.

Deafness has been occasioned by a congenital thickening of the membrana tympani.

A thick membrane has been observed exterior to the membrana tympani, which appears to be a process of cuticle, thickened perhaps by some dried sebacious matter.—12.

Sometimes there is a layer of condensed wax upon the membrane; or the external meatus is obstructed either by a fleshy excrescence, or by an extraneous body.—13.

A large quantity of thick mucus in the tympanum has likewise been productive of deafness, or, at least, has proved the cause of great dulness of hearing.—12.

Valsalva often found the cavity of the tympanum occupied with serous fluid when deafness had come on in the progress of acute diseases.—9.

Once I discovered innumerable membranes intersecting each other, and occupying the whole tympanum. In another body I observed that the fibres of one of the diminutive muscles were contracted.

The venereal disease is not an unfrequent cause of inability to distinguish sounds, in consequence of the eustachian tube being closed by the cicatrix of an ulcer in the fauces.

Paralysis may also be mentioned as one of the causes by which the sense of hearing is sometimes injured or destroyed.—15.

A case is related in the Sepulchretum of a steatomatous tumour being developed betwixt the cerebrum and cerebellum, by which, first, the optic nerves were compressed and amaurosis produced; then the auditory nerve was subjected to compression, from which deafness resulted; and ultimately, the patient died from the progressively extended pressure.—8.

The tinnitus aurium, and other annoying sounds, are probably occasioned by unnatural pulsation of the internal auricular vessels.—9.

Worms in the meatus auditorius.

That worms may be generated in ulcerated ears is a circumstance which numerous authors have attested. A young matron came to Valsalva when I happened to be with him, who related that some time before, at remote intervals, two worms had

been discharged from her left ear.—Previous to the expulsion of the latter worm, which was six months before she came to Valsalva, she had suffered violent pain, extending from the ear to the adjacent temple and neighbouring part of the forehead, but was immediately relieved when the worm was thrown off with a quantity of pus. The worm resembled a small silkworm. On the same day, however, she was again attacked, at various intervals, with a similar but more violent pain. When seized she immediately fell down, and remained insensible till the pain subsided, a period of about two hours. Soon afterwards a third worm was expelled, which, though smaller, coincided in form with the preceding. The deafness of this ear remained, and was accompanied with some numbness and itching of the contiguous parts. Valsalva entertained no doubt that the tympanum was ulcerated.

Those who have ulcers in the ear should never sleep in the daytime of summer or autumn, without having the orifice of the meatus closed, because flies are likely to be attracted, and will deposite their ova, which is the only means by which these maggots are propagated. They never originate from putrefaction. Worms may be removed by fluids injected into the tympanum, or by the smoke of proper substances conveyed thither from the mouth through the Eustachian trumpet.—xiv. 7.

Though I have referred to many lesions of the organ of hearing, I have certainly not adverted to the greater part of them. Boerhaave has justly designated this the most complex of the organs of sense, and has represented its numerous

parts as liable to injury in many different ways. He therefore adds, "*surditas morbus unus sit, et millecuplus.**—15.

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* Morgagni's observations on perforation of the membrana tympani remind us that this subject was brought under popular notice some years ago by Sir Astley Cooper, with the hope of remedying one of the most frequent and hopeless forms of organic surditas; namely, that arising from defect or obstruction in the Eustachian trumpet. It is, however, to be lamented that the expectations excited by the auspicious nature of the earlier results of this operation, have been disappointed. The numerous experiments then made confirm the opinion that the membrane when punctured, and sometimes even when extensively lacerated, is capable of reparation; and indeed the difficulty of circumventing the tendency to closure was one of the greatest which surgeons had to encounter. These experiments also corroborated the opinion that the ossicula may be removed, provided the membrane of the fenestra ovalis remains entire, without the faculty of hearing being permanently and wholly lost. In some cases the benefit obtained by this operation appeared to have been permanent; but this cannot be said of the majority. If, however, the membrane of the fenestra is destroyed, not only will the delicate parts be exposed to impressions they are ill adapted to sustain, but by the escape of the fluid of the labyrinth, the auditory nerve will probably lose its perceptive power.

The principal causes of obstruction in the Eustachian tube are—the protracted effects of cold—cicatrices from ulcers in scarlet fever, the venereal disease, &c.—extravasation of blood—stricture—and nasal polypi or other tumours pressing on the extremity of the canal. It is not possible here to enumerate all the causes by which the sense of hearing may be vitiated or lost. It is well known that organic impediments to the auditory functions may exist in the external meatus, the tympanum, the labyrinth, and the head; and the functional derangements of the ear are not less various than those which pervert the actions of the eye, and they are generally derived from the same sources. Hearing may be confused by heightened as well as diminished sensibility in the organ. Instances have occurred in which the two ears did not

SECTION XIV.

Diseases of the Nose.

On one occasion I observed that portion of the ethmoid bone called the crista galli so obliquely situated, and so constructed, that it rendered the orifices of the cribriform lamella narrower on one

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harmonize. Sauvages relates that a musician whilst blowing his flute heard two distinct sounds at every note. This affection resulted from catarrh and ceased on its termination. At another time he was consulted by a person who, when spoken to, heard two distinct voices, one an octave higher than the other, and not in unison with it. The same author too, describes a curious state of torpitude of the auditory faculty, (which fortunately is not very common,) in which it seems requisite for the ear to be excited by a continued noise before the speech of another person can be distinguished. He reports that a woman whose ears were in this condition, kept a drum in the house, which was constantly beaten whilst she was engaged in conversation. He also mentions the circumstance of a bell-ringer who could only distinguish speech when the bells were ringing; and a third person only during the rattling of wheels.

The causes of congenital deafness are various and uncertain. When a preternatural membrane is stretched across the meatus, it will render the individual deaf till it is divided. Sometimes it has been extended over the external orifice so as to occasion the appearance of a deficiency of this tube. Confusion has been observed in the arrangement of the ossicula. Solid matter resembling cheese, was, on one occasion, found by Mr. Cline to occupy the labyrinth, in which consequently no undulation could be produced. It is a circumstance worthy of observation that the predominant affections at the Asylum for Deaf and Dumb in the Kent Road, indicate the prevalence of a strumous diathesis.

Whilst the ear is an organ of wonderful complexity, nothing can be more admirable than its mechanism. It would, indeed, be an insult to the Deity to conceive that it is redundantly complex, or that its efficiency and adaptation are at all compromised by the perfectly beautiful arrangement of its structures.—*Ed.*

side and broader on the other than usual; so that there was an unequal distribution of the olfactory nerves. Another and more frequent cause of difference between the two nostrils arises from a great inclination of the septum narium to one side. It has been said that this septum has always an inclination to one side in adults, but although this often occurs, my numerous observations convince me that it is by no means universal.

Morgagni, xiv. 16.

Polypi.

Polypi of the nose have not only a diversity of situation, but their textures vary. They have been found fleshy, cartilaginous, and bony. I should consider the latter, however, rather as bony excrescences than polypi. The true nasa polypus seems to be constituted of a tissue between that of glandular and fleshy bodies. Ruysch observed them growing from the maxillary sinus, and proceeding through the excretory foramen into the nostril; and they probably originate from the other cavities. Generally, however, they grow from the Schneiderian membrane exterior to the sinuses, where the membrane is thicker and more obviously glandular.—*Morgagni*, xiv. 17.

A man had polypi growing out of each nostril; and the cavity of the right nostril being laid open after death, a polypus was found connected with each turbinated bone. Their origin could be clearly traced to the mucous membrane of these bones; and the glandular texture of the polypi was the most obvious in the parts nearest to the membrane.

The appearances in the left cavity were not very dissimilar to those in the right.—*Valsalva*, xiv. 18.

At the lower border of the turbinated bones the Schneiderian membrane exhibits numerous red thickenings, which are usually considered to be glands. In a lunatic I found that these parts had enlarged into flaccid caruncles, one of them being pendulous from each of those bones. On dividing them I found that they exhibited red areas between white cancelli, an appearance which confirmed the opinion of their glandular origin and nature. In two persons I saw small bodies like verrucæ on the membranes, and they appeared fungous. I have also seen this membrane on the lamina of the os ethmoides as well as on the septum, thickly covered with bodies which appeared like miliary tubercles, but which I felt assured were enlarged glands. A thin fluid could be pressed out of their excretory duct, and when cut through they were not obliterated; and their texture resembled that of the mucous membrane.—*Morgagni*, xiv. 20.

Abscess and ulceration.

Pus is sometimes discharged from the nostrils, and must proceed from the Schneiderian membrane lining those cavities or the pituitary sinuses. When it forms in the maxillary sinus, it has been removed through the sockets of the teeth. *

* A few years ago, when I resided in the country, some oxen became mad and were killed. Their madness was attributed to the bite of a rabid dog of which, however, there was no certainty. Another having maddened I requested that the head might be sent to me for inspection. The brain exhibited no morbid

In cases of suppuration in the frontal sinuses, Palfin suggested that those cavities might be trephined. This operation indeed is not very desirable, but much greater inconveniences and even death have often resulted from an unarrested ozæna and the caries which has ensued from it. Where an ulcer of the nose was exterior to the sinuses, and yet its precise seat and extent uncertain, Valsalva injected fluids by a syringe, the head and upper parts of which were perforated.

When the septum nasi was partially destroyed by ulceration, Valsalva resorted to internal as well as external remedies to check its progress. He also introduced thin tubuli into the nostrils, of such a shape and figure that the alæ nasi might be supported as far as possible.—*Morgagni*, xiv. 22.

Excessive secretion from the Schneiderian membrane.

From the mucous surface of the nose there is sometimes excessive secretion of a watery fluid. About the end of June 1745 I was consulted by a Venetian woman, who, from the time of being annoyed with coryza and an irritating discharge from the left nostril, in the preceding winter, continued to be teased with a stillicidium, though at the time of her application the fluid was of an unacrimonious quality. Sometimes drops of pellucid water followed one another so rapidly as

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appearances, but I found the left antrum maxillare full of pus, and entertained no doubt that the pain attendant upon its formation had been the cause of the animal's wildness. Palfin observed that intolerable pain was occasioned by suppuration in the pituitary sinuses.—*Ed.*

to amount to the quantity of half an ounce in an hour. The woman was naturally plethoric, but she became emaciated under this continued emission. Bidloo relates an instance of even more profuse secretion of a transparent fluid from this membrane. Twenty ounces were emitted within twenty-four hours. It came on from external injury, and terminated in ulceration.—*Morgagni*, xiv. 21.

Epistaxis.

Large and frequent hemorrhages from the nostrils are often conjoined with visceral diseases, especially of the liver and spleen. The organic lesion may precede the hemorrhage, and indeed may produce it by causing unequal distribution of blood through the body; or it may be consequent to the hemorrhage from a deficiency of blood for the purposes of secretion, and an impaired state of digestive function arising from that source. Whenever visceral disease occasions epistaxis it must be regarded as the remote cause; as the proximate cause is ulceration or rupture of the nasal vessels. The following observation of Valsalva ought not to be omitted.

Morgagni, xiv. 23.

Case 1.

A nobleman who, with a view to strengthen his joints, had made too free use of the mud baths of Verona, became subject to nasal hemorrhage, which returned so often that every week he lost a considerable quantity of blood. Occasionally the hemorrhage was so copious that imbecility of mind and body was induced. These circumstances continued through a period of four years; and

within that time he had consulted the most eminent physicians in the principal cities of Europe, and amongst them Valsalva's opinion had been sought by letter. Written descriptions of cases, however, do not afford so accurate an idea of disease as is obtained by an interview; and at length Valsalva had an opportunity of seeing the patient. He observed, that on wiping the nose, or touching it with his fingers, the hemorrhage, though previously decreasing, was accelerated; and having found in dissection that the blood-vessels were extremely turgid at the line of union between the alæ nasi and bone, about a finger's breadth from the orifice of the nostril, he suspected that the blood was effused from that part, and on pressing it with his finger the hemorrhage ceased. By this easy method the patient was ultimately cured.—*Valsalva*, xiv. 24.

Case 2.

Some vessels were ruptured in the nostril of a poor widow by sneezing, and hemorrhage had continued for nine hours when I saw her. She had very properly been bled. I directed firm bolsters of lint to be introduced, by which the bleeding was immediately suppressed. They were moistened indeed with the juice of nettles, by which alone, when snuffed into the nostrils, I have seen hemorrhage restrained. Soft tents had been tried, but they are unavailable for compression in such cases. She had lost so much blood, however, that sixteen days afterwards my advice was solicited relative to a state of general indisposition, accompanied with palpitation of the heart, and difficulty of respiration.

Some attention to diet, aided by a little medicine, restored her to health.

When the situation of the ruptured vessel is such that the bleeding cannot be restrained by tents, an instrument might be adapted to make compression. The diet on all these occasions must be unstimulating, as gruel and barley water; and even these should be taken in small quantities.

Morgagni, xiv. 25.

Sneezing.

It has been sufficiently proved by medical histories that considerable danger, and even death, may arise from the exertion of sneezing. When death has occurred, it has probably sometimes happened from extravasation of blood in the head; but the following case will show that fatal consequences may ensue without any rupture of vessels.

Apoplexy from turgescence of vessels in the head after violent sternutation.

A nobleman forty years of age, of a corpulent habit of body, and who was reported to be somewhat of a Bacchanalian, had been distressed for some time with difficulty of respiration after eating, and likewise on ascending steps. He was often teased with violent sneezing; and at length, having been excited to this convulsive effort many times in succession, he was suddenly invaded with a sense of constriction at the thorax, and distress of breathing. At the moment that he complained of these circumstances he sneezed again, and died. Some of the persons who were present said that his mouth was distorted.

Dissection. Every thing appeared natural within the abdomen, except an unusual accumulation of fat, particularly in the omentum; and perhaps it was on this account that the thorax appeared somewhat less capacious than usual. The lungs were of livid colour.

There was a small quantity of fluid in the ventricles of the brain, and the vessels were turgid; but there was no extravasation of blood.

Morgagni, xiv. 27.

Sneezing is a species of natural convulsion, but if it becomes excessive, either in degree or frequency, it is easy to conceive that apoplexy may be the consequence. This event, however, generally happens to plethoric persons.

By what means the Schneiderian membrane, when irritated, can draw the diaphragm into sympathetic action, and excite violent sternutation, has been occasion of surprise to many distinguished men: and an argument has been deduced from this well-known sympathy against those who elucidate the consent of parts by a reference to nervous communications. They affirmed that there was no connexion between the first pair of nerves from the brain, the olfactory, and the phrenic nerves which proceed from the cervical; but they forgot the nerves which are transmitted from the fifth pair to the membrane of the nostril; and from which pair Meckel traced a small branch on each side, quite to the intercostals. If there are no other communications between these nerves, which has been a subject of controversy, we are not only at liberty to explain the sympathy between the nostrils and

the diaphragm from this intercourse, but even between the nostrils and the abdominal viscera.

The sympathetic relation which subsists between the Schneiderian membrane and the abdominal viscera, I observed in a nobleman by whom I was consulted some years ago. He was subject to attacks of an epileptic nature, which appeared to commence from the hypochondria, but were preceded by a fetid odour, very annoying to himself, though none of the by-standers could perceive it even when they purposely inhaled his breath. It appeared to me that the irritation in the hypochondria was propagated through the intercostal nerves, and by the small nerve we have just mentioned, to the nostrils, and excited an action in the olfactory nerves similar to that occasioned by the effluvia exhaled from a fetid substance.*

Morgagni, xiv. 28.

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* So generally does the Schneiderian membrane become the seat of sympathetic irritation, from intestinal worms, that itching in the nostrils is recognised as one of the diagnostic signs of their existence. But this does not arise from any peculiarity of excitement, for a similar effect is often produced when the alimentary canal is subjected to continued unnatural stimulation from other causes. Whether the stomach and intestines be infested with worms, pervaded by morbid secretions, stimulated by undigested aliment, or disturbed in their functions by any other causes, the mucous surface of the nasal cavities is very frequently implicated: there is turgidity of its right vessels with itching, sneezing, or repeated hemorrhage—superficial ulceration—enlargement of the mucous glands—or thickening in the other textures of the nose. Certainly these affections, and the fleshy excrescence which constitutes the common nasal polypus, may arise from topical disease, or from some local injury; but I believe they are usually derived from the source to which I have adverted.

SECTION XV.

Injuries of the Head.

The following cases were divided by Morgagni into injuries of the brain without fracture of the cranium, and injuries in which there was either

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The relationship which is maintained betwixt the pituitary membrane of the nose and the mucous surface of the alimentary canal may not only be explained by reference to the communication of nerves, but also to continuity and identity of structure. The coeval formation of polypi in different cavities is not an unfrequent circumstance. When a nasal polypus is suffered to extend and elongate it constitutes a most loathsome and troublesome disease; and by irritating and compressing the adjacent soft and bony parts, the most serious constitutional, as well as local consequences are liable to ensue.

From the peculiarity of the conformation of the nose, epistaxis is sometimes a most uncontrollable form of hemorrhage. I have recently seen two cases in which if it were not absolutely the occasion of death, it certainly accelerated that event. The first was in a gentleman who laboured under hydrocephalus. He was a susceptible man, and would not endure a plug in the nostril. The hemorrhage frequently recurred; and when he had become excessively pallid from loss of blood, it was curious to observe to what an extent the irritative hemorrhagic action was propagated. At first he only distinguished pulsation in and about the nose, but as his strength decreased, and his anxiety and susceptibility were heightened, the carotids could be seen throbbing vehemently, and a corresponding action was perceptible to the patient through their ramifications. The second case was in an old arthritic sufferer, who had been seized with cynanche parotidæa. The more acute inflammatory action had subsided, but the gland was much enlarged and indurated, and the jaw nearly rigid. In this state he was attacked with bleeding from the nose. It occurred sometimes when he was asleep, on which occasions he was threatened with suffocation from the formation of coagula in the fauces, which he removed with the utmost difficulty in consequence

fracture or fissure. For the sake of order I have arranged them under seven subdivisions; namely, injuries without fracture, injuries with fracture of the external table, injuries with fracture of both tables, fractures with injury to the substance of the brain, fractures in the basis of the cranium, disjunction of the sutures, and injury of the diplöe. Cases of injury to the medulla spinalis will be appended. *Ed.*

Injuries of the head without fracture.

Case 1.

Deposition of pus between the membranes of the brain.

A youth, sixteen years of age, was struck with a stone on the left parietal bone near the lambdoidal suture. Nothing worthy of notice ensued till about the seventh or eighth day, when the lips of the wound began to swell. On the eleventh day fever discovered itself, with rigors and vomiting, but unaccompanied with pain in the head. He was subsequently affected with convulsions and aphonia, and also became deaf and blind. He died on the fourteenth day.

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of being unable to open his mouth. The hemorrhage commenced in the nasal cavity nearest to the enlarged gland, but it afterwards took place from both nostrils. He was extensively afflicted with gout, and had indications of hepatic disorganization; but the immediate cause of death was the repeated effusion of blood. The hemorrhagic action was not so extensively manifest as in the preceding case; but when there was feebleness in the radial artery and the extremities were cold, the patient was conscious of a strongly irritative throbbing in the arteries ramifying through the nose and the circumjacent parts. *Ed.*

Dissection. The cranium was uninjured. The dura mater corresponding with the wound both in situation and extent, was thickened and unnaturally flaccid; and its surface was unequal and inclining to a yellow colour. Between this membrane and the pia mater a purulent fluid was deposited, and which had diffused itself over the upper and anterior part of the cerebrum, and betwixt the cerebrum and falciform process. There was no perceptible injury done to the cerebrum itself. *

Valsalva, li. 2.

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* Mr. Pott's admirable work on injuries of the head has commanded almost universal deference; for even where the work itself has not been read, his principles have been so widely promulgated as to influence the general practice in these casualties. As the subjects of this section need some illustration, and as it is not possible for me to elucidate them with equal perspicuity and advantage from any other source, I shall prefix a citation from his writings.

When elucidating the effects on the dura mater and parts within the skull, produced by a contusion on the head, he says— "In order to understand rightly, and to have a clear idea of this "kind of injury, it is necessary to recollect that the vessels of "the pericranium, those of the diplöe or medullary substance "between the two tables of some parts of the cranium, and "those of the dura mater within it, do all constantly and freely "communicate with each other, and that this communication is "carried on by means of innumerable foramina, found in all parts "of both surfaces of the skull, as well as at the sutures; that "upon the freedom of this communication depends the healthy "and sound state of all the parts concerned in it; and that from "the interruption or destruction of this, proceed most of the "symptoms, attending violent contusions of the head, extravasation of fluid between the cranium and dura mater, inflammations of the said membrane, and simple undepressed fracture "of the skull." When a severe blow has been inflicted upon the

Case 2.

The cranium denuded, and the membranes thickened and purulent.

A man nearly sixty years of age received a blow with a stick on the upper part of the left temple.

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head and the vessels are so injured that circulation cannot be carried on, the pericranium has a tendency to separate from the external surface of the bones, and the dura mater from the inner, and the latter of these membranes soon becomes inflamed, and probably suppurates, ulcerates, or sloughs: and the ultimate consequence is a train of perilous symptoms, and frequently death itself. "The effect of this kind of violence is frequently confined to "the vessels connecting the dura mater with the cranium, in "which case the matter is exterior to the membrane; but it "sometimes happens that, by the force either of the stroke or "of the concussion, the vessels which pass between and connect "the two meninges are injured in the same manner; in which "case the matter formed in consequence of such violence is "found on the surface of the brain, or between the pia and "dura mater as well as on the surface of the latter; or perhaps "in all these situations at the same time." "The symptoms "attending an inflamed or sloughy state of the membranes in "consequence of external violence are very different from "those of extravasation of blood, or commotion in the me-"dullary substance of the brain. They are all of the febrile "kind, and never at first imply any unnatural pressure; such are "pain in the head, restlessness, want of sleep, frequent and hard "pulse, hot and dry skin, flushed countenance, inflamed eyes, "nausea, vomiting, rigor; and towards the end, convulsion and "delirium. And none of these appear at first, that is, immediately "after the accident; seldom until some days are past." Whilst these processes are going on in the membraneous tissues, the bone itself undergoes a visible alteration, and deviates widely from its natural colour. The preceding observations, quoted from Pott, apply to cases where there was not even an external wound; and when there had been a solution of continuity, in which suppuration and incarnation were advancing satisfactorily, he says,

There were no unpleasant symptoms at the moment, or for some days afterwards, and he daily

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" all these favorable symptoms will vanish after a few days; the " sore will lose its florid complexion and granulated surface; " will become pale, glassy, and flabby; instead of good matter " it will discharge only a thin discoloured sanies; the lint with " which it is dressed instead of coming off easily, (as in a kindly " suppurating sore,) will stick to all parts of it, and the peri- " cranium instead of adhering firmly to the bone, will separate " from it all round to some distance from the edges. This alter- " ation in the face and circumstances of the sore, is produced " merely by the diseased state of the parts underneath the skull." " The first appearance of alteration in the wound immediately " succeeds a febrile attack, and as the febrile symptoms increase " the sore becomes worse and worse, that is, it degenerates more " and more from a healthy, kindly aspect." If the bone is bare an attentive observer will at first perceive it " whiter and more " dry than the natural one; and as the symptoms increase, and " either matter is collected, or the dura mater becomes sloughy, " the bone progressively inclines to a purulent hue or a whitish " yellow; and if the blow was on or near to a suture, and the " subject young, the suture will often separate in such a manner " as to let through it a loose, painful, and ill-natured fungus." " It is no very uncommon thing for a smart blow upon the head " to produce some immediate bad symptoms, which after a short " space of time disappear, and leave the patient perfectly well. " A slight pain in the head, a little acceleration of pulse, vertigo " and sickness, sometimes immediately follow such accident, but " do not continue many hours, especially if any evacuation has " been used. These are not improbably owing to slight com- " motion of the brain which having suffered no material injury " thereby, soon cease. But if, after an interval of some time, " the same symptoms are renewed, if the patient having been " well becomes again feverish and restless, and that without any " new cause; if he complains of being languid and uneasy, sleeps " disturbedly, loses his appetite, has a hot skin, a hard quick " pulse, and a flushed, heated countenance; and neither irregu- " larity of diet, nor accidental cold has been productive of these,

came to the hospital of St. Mary de Vita for the wound to be dressed. The wound appearing

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" mischief is most certainly impending, and that most probably " under the skull."

When matter or serum is deposited remote from the contused part, it probably arises from the concussion.

" If the symptoms of pressure, such as stupidity, loss of sense, " voluntary motion, &c. appear some days after the head has " suffered mischief, they most probably imply effusion of fluid " somewhere: this effusion may be in the substance of the brain, " in its ventricles, between its membranes, or on the surface of " the dura mater; and which of these is the real situation of such " extravasation, is a matter of great uncertainty, none of them " being attended with any peculiar mark or sign that can be " depended upon as pointing it out precisely; but the inflam- " mation of the dura mater, and the formation of matter between " it and the skull in consequence of contusion is generally indi- " cated and preceded by one which I scarcely ever knew to fail; " a puffy, circumscribed, indolent tumour of the scalp, and a " spontaneous separation of the pericranium from the skull " under such tumour. These appearances, therefore, following a " smart blow upon the head, and attended with langour, pain, " restlessness, watching, quick pulse, headach, and slight irre- " gular shiverings do almost infallibly indicate an inflamed dura " mater, and pus either forming or formed between it and the " cranium."

In some of the following cases, especially those of fracture, it will be evident that the practice had been inefficient; but even these cases are instructive, inasmuch as they tend to show the progress of such injuries when left to themselves. Morgagni indeed was aware, on one or two occasions, that some apology was needful for Valsalva's not having trephined; and he ascribes it to a predominant aversion to the operation on the part of the patient's friends. He relates that the division of the dura mater, to remove matter from beneath it, had been proposed by eminent surgeons; but he does not record any instance of its having been performed. He was fully sensible of the difficulty which would usually arise in determining the seat of pus or of extravasated blood.—*Ed.*

cutaneous, and no serious consequences anticipated, he continued to pursue his usual occupations, and during four or five very cold days he stood in the market-place selling chestnuts. On the sixth day, however, the wound assumed a more unfavourable aspect, and the man was assailed with rigors and fever. He had a recurrence of febrile paroxysms every day; the wound became slightly gangrenous; and the man's death was lingering and gradual.

Dissection. A sinus containing pus descended from the wound between the extreme border of the temporal muscle and the bone. The wound by sloughing had spread to about the extent of a five-shilling piece, and through that space the bone was denuded. No fissure, however, could be detected in the cranium. The membranes of the brain, corresponding with the portion of naked bone, were thickened and covered with pus. The cerebrum beneath these thickened meninges had a point of suppuration upon it about the magnitude of a vetch, and was penetrated by a small foramen.—*Valsalva*, li. 3.

Case 3.

Deposition of pus upon the dura mater, and the membrane ulcerated.

A young man about twenty-three years of age had two wounds inflicted on the scalp, one on the left part of his forehead and the other on the occiput. He made repeated but fruitless efforts to vomit. About the twenty-fifth day he died.

Dissection. In relation to the wound of the

occiput nothing worthy of notice was observed. In that of the forehead pus was discovered between the scalp and cranium. The pericranium and internal surface of the integuments appeared as if they had been eroded by herpes exedens; and pus had somewhat detached the anterior part of the temporal muscle. The os frontis itself had sustained no lesion; nevertheless, betwixt the bone and dura mater two drams of a purulent fluid were deposited, and the membrane was in a state of ulceration. On the right side, beneath the upper part of the cranium, and in the interstices of the blood vessels of the dura mater, matter was found which in all respects resembled pus, except that it was more dense in its consistence.—*Valsalva*, li. 5.

Case 4.

Deposition of pus on the dura mater.

A man forty years of age fell from a considerable elevation and bruised his left eye. The superciliary integuments were lacerated, probably by a sharp stone. He became feverish soon afterwards, but this pyrexia subsided. About the twelfth day, after indiscretion in diet, he had a more violent accession of fever; and on the fourteenth day the whole left side of the face became affected with spasms, attended with excruciating pain in the eyeball. He died about the twentieth day.

Dissection. Beneath the laceration in the skin, the supraorbital nerve was situated, which being contused or otherwise injured might easily excite the spasmodic affections. The external part of the eye was putrid, and the bones of the upper

part of the orbit were somewhat carious, but not to such a degree as to affect the superincumbent cerebrum. Towards the left part of the occiput, however, a small portion of the cerebral substance exhibited a brownish colour, and pus was secreted upon the external surface of the dura mater corresponding with this discoloured part.—*Valsalva*, li. 7.

Case 5.

Deposition of serum, and adhesion of the dura mater.

A man sixty years of age, subject to epilepsy, fell to the ground during one of the paroxysms, and received a blow on the left side of the head, and on the corresponding side of the thorax. He had considerable pain in that part of the chest, his respiration became difficult, and he brought up some blood in his exertions to vomit. His mind was imbecile, and he felt a sense of weight in the head, so that when spoken to he scarcely answered.

Dissection. The left cavity of the thorax was healthy, but the right contained about a pint of serum; and the lung on this side was universally indurated, and the upper lobule was adherent to the costal pleura. The left temporal muscle was a little bruised; and a portion of coagulated blood was found between the left os petrosum and the dura mater: and this membrane was so closely united to the petrous process that they could not be separated without considerable violence. By the sides of the vessels in the pia mater there was a sort of gelatinous deposition, and the ventricles contained a little serum.—*Valsalva*, li. 6

Case 6.

Deposition of serum, and the membranes sphacelated.

A woman fifty years of age fell and struck the side of her forehead against the ice in December 1725. The bone was denuded to the extent of two or three digits. She was brought into the hospital; and had a slight disposition to vomit. Without any perceptible debility the wound became dry and livid, and the woman died on the following day, which was the eleventh after the accident.

Dissection. Though not more than twenty-four hours had elapsed from the time of death, the body was extremely fetid. The posterior part of the lungs was black, and the heart was flaccid.

The contused portion of the os parietale was of a livid hue, both externally and internally. There had been a deposition of serum under the membranes; and the membranes themselves, corresponding with the discoloured bone, were also of a livid and greenish colour.—*Morgagni*, lii. 2.

Case 7.

Deposition of pus, and sphacelation of the membranes.

A poor woman having become insane through grief, wandered about the streets injuring no one, but suffering the scoffs and insults of an inhuman rabble. She was at length struck upon the head by a cruel fellow, and having symptoms of concussion of the brain she was brought into the hospital, and died on the tenth or eleventh day.

Dissection. The body rapidly became putrid. Passing over other morbid appearances, which did

not result from the injury, the state of the head only will be mentioned. Though the cranium was entire, yet pus was seated between it and the dura mater; and this membrane appeared to be affected with sphacelus.—*Morgagni*, lii. 4.

Case 8.

Deposition of pus and serum; the dura mater thickened.

A woman had two wounds inflicted upon the side of her head by a cutting instrument. They had nearly cicatrized when she exposed herself to the agency of a cold atmosphere; and having disturbed the wounded temporal muscle by the mastication of hard food, the whole face became swollen. She then had rigors, and convulsive motions in the head, with occasional slight delirium; and at length respiration became stertorous, and death ensued.

Dissection. The dura mater was thickened; and in different parts of it there were red marks which appeared like drops of blood, but they could not be wiped off. A small quantity of pus was deposited between the membranes, under the right anterior lobe of the cerebrum. The vessels of the pia mater were turgid; and beneath this membrane, and also in the ventricles, there was a small quantity of serous fluid, which in the cavities had a reddish tinge. The bone was denuded, and a small foramen allowed a probe to pass through it into the orbit, but the aperture did not communicate with the cavity of the cranium.

Morgagni, lii. 6.

Case 9.

Deposition of pus and serum.

An old man, when in a state of intoxication, had a wound inflicted with a stone on one side of the head, but he neither fell nor vomited. Some days afterwards the bone was observed to be rather livid; and a few days from that period the wound became dry and had an unfavourable aspect, accompanied with fever and a languid pulse. At length the fever disappeared, the state of the pulse improved, and the man consequently seemed better; but after an interval of some days the febrile symptoms returned, accompanied with heaviness in the head, torpor of mind, slight delirium, and redness of the face and eyes. He died on the twentieth day subsequent to that on which the blow was received.

Dissection. The cranium and dura mater were thick but not diseased. The external surface of the pia mater which corresponded with the blow had pus formed upon it which had a fetid odour. The subjacent cerebrum was of a blackish colour through its cortical substance. Both the lateral ventricles contained a superfluity of reddish serum; but the larger quantity was in the ventricle under the wound. The choroid plexuses were of a pale colour.—*Morgagni*, lii. 10.

Case 10.

Deposition of serum and of coagulable lymph, with pulmonary disease.

An old man of sallow complexion, and who was considered to be asthmatic, fell from an eminence,

and struck the right side of the head against a stone. The cure of the wound advanced satisfactorily till the eleventh day, when difficult and stertorous respiration supervened. He had no pain in the thorax, but complained of an uneasy sensation beneath the right hypochondrium; and when the hand was laid upon that part an impression of bubbling was conveyed to it. The head appeared to be exonerated from disease; but the man could not sleep, and had subsultus tendinum. The pulse throughout had been frequent, and at length became small. Within a day or two after the difficulty of respiration came on, he expired.

Dissection. The stomach and intestines were inflated with gas; the small intestines were inflamed in a particular part, and were not exempt from fetor. The liver was somewhat indurated; and the spleen was exceedingly flabby. The anterior surface of the lungs was connected with the costal pleura; and though neither the legs nor feet had swelled, both lobes were surrounded by a superabundance of water. On the left side it had a bloody tinge, and was smaller in quantity than in the opposite cavity; in which the fluid was of a yellowish green colour. On the right side the pleura was in a sloughy state. The pericardium contained some reddish serum; and the heart, frothy blood. The right parietal bone was denuded to the extent of a digit and a half, which portion was of a blackish colour; and though in reality there was no fissure, yet it was surrounded by a kind of furrow as if the external table had subsided; the inner surface was of the same colour,

but was not circumscribed by a sulcus. Upon the dura mater beneath this part there was a thickish ichor; and a kind of spurious membrane similar to those concretions which form in the thorax during inflammation, was attached to its internal surface; and between this membrane and the pia mater a drop of a thick and whitish ichor was interposed. Underneath the pia mater a moderate quantity of serum was effused; and the lateral ventricles were occupied by a small redundance of serous fluid tinged with blood. The texture of the cerebellum was soft, and all the muscles of the body were relaxed.—*Morgagni*, lii. 8.

The two following cases were communicated to me by Mediavia.

Case 11.

Deposition of pus remote from the injured part.

A boy fourteen years of age received a blow upon the forehead from a pole, about the middle of July 1739. Vomiting and fever ensued, but the latter had disappeared by the fourth day. On the eleventh day he had a recurrence of febrile symptoms, accompanied with continued torpor, and occasional delirium, alternating with convulsions or epistaxis; though he had been freely bled. He died a few days afterwards.

Dissection. There was scarcely any difference to be perceived when that portion of the cranium on which the percussion had been received was compared with the rest. Upon the subjacent part of the dura mater something like mucus was deposited; and the membrane itself had not its natural

appearance. Betwixt this membrane and the pia mater, on the upper surface of the same hemisphere, there was a large quantity of fetid pus, having a greenish yellow colour. That part of the membrane which had been covered with pus was three or four times its usual thickness, and presented a somewhat granulated surface.—*Morgagni*, lii. 19.

Case 12.

Deposition of serum remote from the injury.

A robust country youth having fallen from a considerable elevation struck the side of his head. No serious consequences appeared at the time, nor did any threatening symptoms arise during the three following days. He lived as usual, and pursued his accustomed duties. At the expiration of that period the contused part became tumid; and fever having manifested itself he came to the hospital. Under medical and surgical treatment he had nearly recovered, when, on the seventeenth day from the accident, being impatient of the restraint on his appetite, he indulged himself by eating to excess. The fever was heightened, the head became universally painful, and vomiting came on, but he did not then divulge his irregularity. Other means having failed, an eminent surgeon trephined him on the place where the injury had been sustained, but the subjacent dura mater was found perfectly natural. The boy, however, appeared again to be convalescent: but he was then suddenly attacked with pleurisy, and died a few days afterwards, without any indication of augmented disease in the head.

Dissection. No part of the body was inspected except the head. The skull was exceedingly thick, but did not exhibit the slightest evidence of lesion; nor was there any deviation from the natural state amongst the encephalic structures, except that serum, having the appearance of a yellowish jelly, was deposited beneath the dura mater to an extent of three or four digits, at a more anterior part of the head than that on which the blow had been received.—*Morgagni*, lii. 15.

Blood is often extravasated from contusions on the head remote from the injury; and also from other causes of concussion of the brain: but this is not always found to have happened in fatal cases of concussion, for the shock itself not unfrequently occasions death within a few hours. The consequences of violent commotions, however, may not always disclose themselves till after a considerable interval.

Injuries of the external table of the skull.

Case 1.

Deposition of serum.

A man about seventy years of age fell from a considerable eminence, and received a blow upon the posterior part of the right parietal bone. At first he lay in a state of half-insensibility; and though the stupefaction soon went off and he walked by himself to the hospital, he had no recollection of the accident. During some days the wound was not attended with any unfavourable symptoms; but on the seventh or eighth it began to assume a gangrenous appearance, and fever was united with

this unpropitious change. In a few days both these circumstances were overcome, but the man complained of a heavy though not violent pain at the back of his head. About the twentieth day he was seized with fever, accompanied with rigor and vomiting. The fever recurred daily about twice or three times; the functions of all the vital organs were impaired; and the man died about the thirtieth day.

Dissection. A portion of the right os parietale, near the junction of the sagittal and lambdoidal sutures, had its exterior lamina broken in pieces; but it was perfectly whole internally. Betwixt the meninges, and within the lateral ventricles, as much as four ounces of serum was deposited; and the cerebrum was of a soft texture.—*Valsalva*, li. 9.

From the immediate stupor, and the total forgetfulness of the fall, no doubt can be entertained that there had been considerable concussion of the brain in addition to the external injury.

Morgagni, 10.

Case 2.

Suppuration of the pia mater.

A woman upwards of forty years of age, falling from a high ladder, struck the left sinciput a little above the temporal bone. At first she lay apparently lifeless, but soon appeared to have completely recovered herself, and to have sustained no other injury than a cutaneous wound. About the fourteenth day the skin around the wounded part assumed a gangrenous appearance, and this alteration was accompanied with fever; nevertheless, the unfavorable aspect of the wound as well

as the fever were removed within a few days. Before the thirtieth day, however, she had a recurrence of febrile symptoms, with rigor; and on the thirty-fourth day she experienced an apoplectic attack, with privation of speech and loss of motion in the whole right side of the body, but she retained sensibility in the paralytic parts, and also afforded evidence of comprehending what was said to her. The whole body was affected with a species of epileptic convulsion. She died about the fortieth day.

Dissection. The external lamina of the cranium, at the part where the blow had been received, was opened in the form of a semicircle, but the corresponding internal table remained unbroken. The pia mater beneath that part was covered with pus, and the subjacent cerebral substance was of a pallid brown colour. The ventricles and the whole right side of the encephalon preserved the healthy structure.—*Valsalva*, li. 11.

Case 3.

Ulceration of the membranes of the brain, after hospital gangrene.

A young woman, twenty-five years of age, fell down and wounded the left part of the forehead with a sharp stone. She was received into the hospital, where she had continued fever; and the febrile symptoms daily augmented in violence. This circumstance happened in June 1689, at which season all the wounds became gangrenous, and this young woman experienced the common fate. Some time afterwards her mind became fatuitous;

she could scarcely hear, nor did she speak again; but her eyes were fixed on the persons near her. At length, tremor of the whole body came on, and continued till the commencement of the twenty-eighth day, when she died.

Dissection. Beneath the wounded integuments there was a small indentation in the bone, and an excavation from which three fissures extended; but they did not penetrate the internal table. The membranes corresponding with the wound, however, were ulcerated; and pus was diffused from the ulcer over the whole cerebrum, occasioning an offensive odour, and imparting a blackish colour to that surface.* —*Valsalva*, li. 12.

Case 4.

Deposition of pus and lesion of the brain, accompanied with jaundice.

A young man, eighteen years of age, was struck with a stone upon that part of one of the ossa parietalia, whence a portion of the temporal muscle arises. Two days elapsed without any symptom worthy of notice, except a degree of fever. On the sixth day, whilst lying in the hospital of St. Mary de Vita, the wound became livid, the discharge was extremely fetid, and the fever assumed a more acute form. About the eighth day he fell into a state of coma, and his face became tumid

* The prevailing degeneracy of ulcers alluded to in this history, will be recognised as an instance of hospital gangrene, probably arising from an unhealthy constitution of the general atmosphere, or insalubrity of the hospital wards from deficient ventilation.—*Ed.*

and yellow. These symptoms continued till the eleventh day, when he expired.

Dissection. The whole body had an icteric appearance. From the wound numerous sinuses proceeded between the cranium and scalp. The latter was ulcerated; and the bone exhibited some asperities on its surface in consequence of the blow, but the injury did not extend to the inner table. Between the bone and the dura mater, in the interstices of the meningeal vessels, an ash-coloured matter was found, not much unlike condensed pus. It was situated beneath the seat of contusion, and the subjacent part of the cerebrum was of a livid colour to the depth of two inches.

Valsalva, li. 14.

Case 5.

Deposition of pus between the membranes.

Another young man about the same age, of a sanguineous temperament, was wounded on the upper part of the forehead, on the left side, November 1, 1688. He instantly fell, and had some confusion of intellect. At first, all the functions were naturally executed, and there was an absence of fever. On the eleventh day febrile symptoms were perceptible, and from that time they increased daily. The wound discharged a bloody serous humour instead of pus; the forehead became swollen; the head and limbs were painful; and about the end of the fifteenth day, these parts were affected with spasm: delirium supervened, and the youth died in the course of the day.

Dissection. A considerable quantity of pus extended beneath the integuments quite to the

eye. The cranium had sustained only a superficial external injury. Betwixt the dura and pia mater corresponding with the wound, a purulent fluid was formed; but no lesion was discoverable in the membranes or brain, except turgescence of vessels in the part where pus had been secreted. In that situation they were so full of black and coagulated blood as to appear varicose.—*Valsalva*, li. 15.

The following case was communicated to me by Mediavia.

Case 6.

Extravasation of blood into the ventricle.

A man, falling upon his face, struck the right side of his forehead against the ground. Neither vomiting nor any other symptom of injury immediately ensued; but there was a sensation of slight disturbance at the stomach. Soon afterwards, however, he was seized with considerable fever, and a tendency to coma; but about the fourth day both these affections disappeared and he seemed perfectly well. However, as the bone had been laid bare, he remained in the hospital. About the seventeenth day, violent febrile symptoms arose, with a rather profound lethargy. The wound and the pericranium assumed a brown colour; but when the latter was scraped away the bone was found to be white. He died on the 12th of April 1740, about the twentieth day from the accident.

Dissection. In the skull a fissure was observed which passed transversely a little above the eyebrow; but it did not penetrate the inner table.

Between the dura mater and cranium a small quantity of a secretion which resembled jelly was deposited; and the whole of the corresponding hemisphere of the cerebrum, quite to the lateral ventricle, was of a greenish black colour, and exhaled a putrescent odour. The anterior part of this ventricle was dilated to such a degree as to contain, without laceration, as much coagulated blood as was equal to a man's fist. The remaining part of this, and the whole of the left cavity, were occupied with bloody serum.

Morgagni, lii. 23.

It is most probable that some vessel of the choroid plexus, or of the parietes of the ventricle, had been slightly ruptured at the time of the casualty, and that the ventricle was expanded, without the medullary substance being torn, by the effusion of blood being very gradual. Had it been suddenly extravasated, it is likely that death would have ensued much earlier. The continuance of health from the fourth to the seventeenth day, should not be adduced as an objection to the conjecture that the bursting of the vessel was coeval with the accident; because even a protracted immunity is not incompatible with very slow effusion into the brain. We may suppose, from the sphacelated state of that organ, that a morbid condition of its substance had preexisted. It happens not very rarely, that in the most important lesions of the brain, either there is no symptom of it, or the indications are but very slight, for a much longer period than in the preceding instance.—24.

Fracture of both tables of the skull.

CASE 1.

Deposition of pus between the dura and pia mater from fracture; with tuberculated lungs.

A young man twenty-six years of age, was wounded by a stone on the right corner of the left supercilium. He instantly fell, but rose again with celerity, and pursued the individual who threw the stone. He afterwards came to the hospital of St. Mary de Vita; and though he felt but slight injury, he was urged to remain. At the time of this accident he was labouring under quartan fever; and the paroxysm was expected, and indeed occurred, on the day he received the injury: but the intermittent was converted into continued fever, with a full and strong pulse, and considerable pain in the head. About the seventh day delirium supervened, with some convulsive motions; and on the eleventh day, the febrile accessions, accompanied with rigor, were more distinct. At length the delirium ceased, and the man lay in a state of coma, attended with convulsions. During two days previous to his death, the right hand was in a state of immobility, but not wholly destitute of sensation. Respiration became laborious, and he died on the fourteenth day.

Dissection. A small abscess was observed by the side of the wound; and part of the matter of this abscess had insinuated itself between the muscles and skin towards the ear. The bone under the wound was fissured; and the dura mater corresponding with it had sustained a degree of

injury. Suppuration had also taken place between this part of the dura mater and the contiguous portion of the pia mater. The subjacent surface of the brain was discoloured. At the basis of the cerebrum there was an accumulation of serum. There were tubercles of considerable hardness in the lungs, some of which, when divided, were found to contain pus; but others, which had not suppurated, possessed a degree of firmness which coincided with that of a glandular body.

Valsalva, li. 17.

Case 2.

The cranium fractured and depressed, and serum deposited in the brain; with peripneumony.

A boy thirteen years of age, was struck with a stone on the right side of the head, above the temporal muscle. He immediately fell, and experienced some confusion of intellect, which was accompanied with vomiting. He was carried into the hospital, and continued exempt from febrile symptoms until the fourteenth day. At the time when fever arose, there was copious suppuration in the wound, and a little purulent matter was expectorated. About the twentieth day mental wandering came on, and five days afterwards the boy expired.

Dissection. On reflecting the scalp, small abscesses were observed about it and the pericranium, but they had no perceptible communication with the wound. Beneath the wound the cranium was fractured and depressed, and adhered closely to the dura mater; and into this membrane some spiculæ of the bone were fixed. The membrane,

however, was not lacerated; nor was there any lesion of brain, except that about two ounces of serum had been deposited, and escaped as the cerebrum was removed from the cavity.

The lungs were exceedingly florid, and small vomicæ had formed in their structure.

Valsalva, li. 18.

CASE 3.

Fracture of the os frontis and of six dorsal vertebræ.

In the month of April 1740, a man, whilst pruning a lofty vine, fell headlong to the ground, and was immediately rendered speechless. Some cordial liquid being poured into his mouth, he vomited; and his pulse, which at the first moment was contracted, afterwards developed itself: nevertheless all the circumstances progressively grew worse; urine and fæces escaped from him involuntarily; and death ensued within four hours.

Dissection. Thirteen hours after death when the body was inspected, it was found to have considerable rigidity. In more than one place on the sinciput there was an appearance of ecchymosis, and blood dribbled from the mouth and nostrils. The os frontis was fissured; and as the cleft pursued a course through the frontal sinus and orbit, the emission of blood from the mouth and the nasal cavities was accounted for. Blood was extravasated beneath the anterior part of the dura mater, and likewise into the lateral ventricles; and in both these situations it retained its fluidity. A large quantity of fluid blood was found in both cavities of the thorax, in consequence of the ribs being broken, and of their uneven extremities having

pierced the pleura, and lacerated the intercostal arteries. When the corpse was turned upon the abdomen, and the muscles of the back were removed, I discovered a circumstance not easy to be understood in reference to a person who by falling from an elevated station had fractured the os frontis. The incident alluded to was, that six of the upper dorsal vertebræ were so fractured that considerable portions of them had been wholly detached from their bodies. Contemplating these facts I conjectured that the head had been fissured before the man reached the ground, by collision with some hard body. The serious mischief done to the vertebræ, and consequently to the spinal marrow, sufficiently explained the inability to retain the urinary and alvine excretions.

Morgagni, lii. 34.

CASE 4.

Depression of the os frontis, and formation of pus between the membranes.

A herb-man was struck upon the forehead near the coronal suture by a blunt instrument. Subsequent to the blow he experienced a tendency to syncope. He came into the hospital, and till the eleventh day there were no untoward symptoms, but every thing portended a favourable issue. On that day, however, he was seized with violent fever, which commenced with rigor and excessive vomiting of bile; and he had a daily recurrence of febrile symptoms till the fourteenth day from the blow, when some hebetude was observable. A few hours afterwards he became senseless, respired with difficulty, and died before the end of the day.

Dissection. The os frontis was slightly depressed; and an unequal and sharp lamina had been detached from its inner surface, and had wounded the dura mater, and consequently pus had formed betwixt that membrane and the pia mater, whence it had descended from the vertex nearly to the base of the cerebrum, and also to the bottom of the cerebellum, on the corresponding side.—*Valsalva*, li. 30.

Case 5.

Depression of the os frontis, and effusion of serum.

A man, fifty years of age, having been wounded by a cutting instrument on the sinciput, immediately vomited. He was received into the hospital, and the bone was found to be so depressed that its elevation was impracticable. At first there was no pain in the wound, but after some days the man was conscious of a tingling sensation in it. The whole body was affected with convulsions on the eleventh day, and life became extinct.

Dissection. The depressed portion of bone adhered very closely to the dura mater, which was slightly inflamed. Betwixt this membrane and the pia mater a thickish fluid was deposited, which in colour resembled serum.—*Valsalva*, li. 32.

In other instances resembling this, vomiting was immediately consequent to the injury; and at the expiration of a few days fever came on, and the patients died lethargic, in consequence of the formation of pus between the membranes. But in some cases extravasation of blood occasioned a much more speedy termination of life.—*Ed.*

Case 6.

Fracture and depression, with counter-fissure. The relicks also of a former removal of bone.

A man fifty years of age, was struck with a stone about the middle of the left eyebrow, where the supraorbital nerve emerges from the orbit. After many hours had elapsed he was brought into the hospital, where it was requisite to confine him in bed on account of his violent convulsive agitation. The eyelids were closed, and his mental faculties annihilated; and he died thirty-six hours from the time of receiving the injury. During the last hour of life there was a cessation of convulsion.

Dissection. The cranium above the orbit was broken into numerous fragments, and an acute splinter had irritated the dura mater, and produced inflammation in that membrane. On the opposite side of the head, a fissure was likewise discovered. A serous secretion was found in the cerebrum, which bore a slight resemblance to sanies. In consequence of some antecedent injury to the head, a portion of the cranium had been removed, and a thick membrane, to which the dura mater very closely adhered, was now substituted.

Valsalva, li. 39.

The possibility of counter-fissure has been a point of controversy; and though it does sometimes happen, it is a rare occurrence. It is probable that many of the cases which are recorded as examples of counter-fissure originated from the head having received a blow at opposite parts by the same accident, or from an extension of fracture to that

part; and under neither of these circumstances can it with propriety be designated counter-fissure. Strictly speaking those cases only are entitled to this appellation in which the solution of continuity is not beneath the part at which the stroke was received; but it is by no means requisite that it should exist at the opposite side.—*Morgagni*, li. 40.

Case 7.

Fracture, with extravasation of blood on the contrary side.

A man thirty years of age, in a paroxysm of delirium from acute fever, cast himself from a window and wounded the left side of his head, above the temporal muscle. He was rendered speechless; his face was florid; the whole of the left side of his body was motionless, except that one or two hours after the fall, whilst the wound was handled, the foot contracted slightly, and soon afterwards extended itself. He died on the third day.

Dissection. The cranium was fissured in the part beneath the left temporal muscle; but there was no manifest lesion of the encephalon which corresponded in situation with the fracture. On the opposite side, however, about two ounces of blood were extravasated between the dura and pia mater; so that it was evident that the hemiplegia of the left side was occasioned by this sanguineous effusion, and not by the wound or fracture of the same side. The vessels of the pia mater were turgid with blood; but this turgidity probably had more relation to the previous delirium than to the accident.—*Valsalva*, li. 42.

Fractures with injury of the substance of the brain.

Case 1.

A young man twenty years of age, was struck on the head with a sharp instrument, and the temporal muscle was cut in a transverse direction. After the blow he proceeded a short distance, and then fell and became speechless. When interrogated he replied by nodding his head, though he did even this tardily. At the expiration of some days, however, he regained ability to speak, but his language betrayed a state of mental alienation. He had no command over his right hand, but when it was pricked he indicated a consciousness of pain. About the fourteenth day he was released from bodily suffering by death.

Dissection. The instrument which inflicted the wound had not only divided the fibres of the temporal muscle, but had perforated the cranium, and penetrated deeply into the brain; and from the part at which it terminated, ulceration had proceeded to the left ventricle. This cavity was occupied by serous fluid.—*Valsalva*, li. 44.

Case 2.

Another young man about twenty-two years of age, received a violent blow with a cutting instrument, by which he also was wounded at the upper part of the left temporal muscle. He instantly fell, and was speechless; but he afterwards regained the power of speaking, and all the other faculties were likewise restored. About the fourth day, however, the aphonia returned, and the deprivation

of speech was accompanied with convulsive motions. These irregular muscular actions were slight in the left side. In the contrary side, however, they were not only perpetual, but sometimes the contraction was so violent as to curve the body in that direction. By nodding his head he intimated a comprehension of what was said to him. The fever daily increased, but his strength diminished, and from this circumstance his convulsions were less violent; and they ceased altogether some hours before he died, which happened on the thirteenth day.

Dissection. The weapon had pierced so deep into the substance of the brain, as to reach within an inch of the ventricle, and the cerebral wound contained pus. The dura mater, in the circumference of its perforation, was considerably thickened. The ventricles contained a moderate redundance of serum.—*Valsalva*, li. 45.

Though Valsalva had uniformly observed that when paralysis ensued from lesion of the brain, it always affected the contrary side, yet he occasionally noticed that the corresponding side was the seat of spasms; and in general the solution of muscular action which exists in paralysis, and those irregular actions which constitute spasm are attributable to the same causes. Cases, however, have fallen under my observation, in which the injury of the brain, and the consequent muscular immobility, were on the corresponding side.

Morgagni, 46, 48.

Case 3.

A man was received into the hospital in consequence of having been wounded with a cutting instrument on the anterior and also on the posterior part of the head, on the left side. On the fourth day he began to complain of extremely violent pain in the loins, and within a few days the pain extended over the whole body. On the sixteenth day he was seized with aphonia, and afterwards experienced a total abolition of the mental faculties. He died on the twenty-fifth day.

Dissection. The anterior wound penetrated to the beginning of the medullary substance of the brain, and the posterior had transpierced the cerebrum quite to the left lateral ventricle. That ventricle contained a considerable excess of serous fluid; and when this fluid was brought into contact with the tongue, it produced a biting sensation that was of long continuance.—*Valsalva*, li. 53.

Case 4.

A husbandman, forty years of age, was struck on the right side of the sagittal suture with a bill, the beak of which penetrated the cerebrum. The whole body was immediately seized with trembling, and the intellectual functions were retarded. Through the whole of the left side of the body the power of motion was diminished, and on the fourth day entirely destroyed; but sensibility continued. The man's face was florid, his respiration oppressed, and his pulse languid. At length a reddish matter was emitted from the bone, and death occurred on the seventh day.

Dissection. The upper part of the cranium had not only been perforated, but a scale of bone had been elevated from its situation. Whilst dividing the dura mater, after the removal of the calvarium, there was a copious efflux of blood. The wound had perforated the longitudinal sinus, and reached from thence into the left ventricle.* This cavity contained a serous fluid and grumous blood, and its floor was in a state of ulceration. There was considerable accumulation of blood in the left lobe of the lungs.—*Valsalva*, li. 54.

In the following instance of cerebral lesion, some days elapsed before any perilous consequences were manifested.

CASE 5.

A man thirty years of age, and of a bilious temperament, was struck with an acutely pointed instrument above the right eye. During three days he had no perceptible derangement of the animal functions. On the fourth day he came to the hospital, but the injury even then presented no alarming character,—indeed it appeared to be a mere contusion; nevertheless, contrary to the prognosis of his physicians, he died the same day.

Dissection. The cranium being opened, a small quantity of purulent matter was detected between the os frontis and dura mater. It was also discovered that the instrument had passed between the eye and the orbit, and had actually perforated this arch, and then passed through the cerebral

* Morgagni suspected that some inaccuracy had been committed by Valsalva, and that he had inserted *left* instead of *right* ventricle. The circumstances warrant this suspicion.—*Ed.*

substance to within a finger's breadth of the corresponding lateral ventricle.—*Valsalva*, li. 57.

Numerous cases are registered in medical works, in which the patient survived an injury of the brain, occasioned by a wound through the orbit, for nine, twelve, fourteen, and even twenty-one days: but I have met with no instance in which there was a more complete exemption from inconvenience than in this. In some of the other cases alluded to the animal functions indeed appear to have been but slightly disturbed till near the period of decease.

The upper part of the orbit is so extremely thin, that wounds inflicted with a pointed instrument in that direction are not to be lightly regarded, especially if there should be a supervention of sleepiness, nausea, fever, vertigo, or any sign of paralysis.

But injuries of this nature have not invariably proved fatal, for even where amaurosis of the corresponding eye, and paralysis of the opposite side have resulted, the patient has been known to survive.

In a case related by Nebelius there was paralysis and aphonia, but the patient regained perfect health in about six weeks.*—*Morgagni*, 58.

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* It is sometimes astonishing how much injury the brain will support. Splinters of bone have been thrust into it, and fragments of its substance have come away; and though paralysis and convulsions ensued, yet the patient has ultimately recovered. In cases of hernia cerebri large portions have been sliced off without being destructive to life. If such cases are inexplicable, they afford striking and encouraging evidence that the brain possesses considerable power of sustaining and repairing its organic lesions.—*Ed.*

Fractures in the basis of the cranium.

CASE 1.

A man fifty years of age was struck by a loose horse, and thrown to the ground with such impetus that the back part of the cranium was fractured by its collision with a stone. At first he lay apparently half dead; a little afterwards, however, he uttered a few words, but they were scarcely intelligible. Blood distilled from the right auditory meatus, and also from the nostrils and mouth; and by its accumulation in the fauces he was threatened with suffocation. Vomiting afterwards came on, and recurred so violently that instant dissolution was expected. About half an hour after the accident the power of motion was destroyed, and sensibility also became extinct; but the functions of respiration were performed naturally. His face was generally pale, but sometimes livid. At the expiration of twelve hours he began to breathe tardily, and died two hours afterwards.

Dissection. In the middle, though indeed, rather inclining to the right side, the os occipitis exhibited a very large and wide fissure. It extended through the basis of this bone to the foramen magnum, and cutting this aperture obliquely, passed onward to the petrous portion of the temporal bone. There had been copious extravasation of blood betwixt the dura and pia mater at the basis, and also at the anterior part of the cerebrum.—*Valsalva*, li. 51.

The blood which had been effused anteriorly, might have escaped from vessels ruptured there by

concussion; for there are vessels of considerable size which pass from one membrane to the other, and which are very liable to laceration from any violent shock sustained by the brain; or the blood might have been carried forwards from the base of the cerebrum. Vessels exterior to the cranium might be ruptured from the same cause, and the blood poured from them may flow through the ears, nose, or mouth; but if the fissure happen to reach the petrous process as in the preceding case, or if the blood be extravasated betwixt the dura mater and cranium near the foramina of the tympanum, blood might find access to the tympanum and be discharged from that cavity, through the Eustachian tube, into the nostrils and fauces.—*Morgagni*, 52.

I was favoured with the following case from Mediavia.

CASE 2.

A country woman fell down stairs, and injured her head to such a degree, as instantly to destroy the powers of speech and motion, and to annul sensibility. Blood escaped from her nostrils and from one ear, and she died within an hour.

Dissection. A large quantity of coagulated blood was contained within the cranium, and the basis cranii was fractured transversely. The fissure traversed from side to side, passing anterior to the petrous portions of the temporal bones, and through the posterior part of the sphenoidal sinuses. In that ear from which the blood had escaped, the osseous part of the meatus auditorius was fractured, and the membrana tympani

was lacerated. The lateral sinuses of the dura mater were also ruptured, and the cerebellum itself had sustained injury.—*Morgagni*, lii, 25.

Lesions of the cerebellum, in general, are more speedily destructive than equal injuries of the cerebrum; at least, this occurs in the more complicated animals. It must be admitted, however, that the cerebellum has frequently been the seat of considerable disease, and yet life itself has not been affected for a considerable period. To those diseases which are induced by degrees and which advance slowly, the body, in some measure, accommodates itself; and, as far as possible, supplies the deficiencies which result from suspended action in the diseased part.—26.

I believe there will not be found more than two instances in the human subject, in which death has not very speedily ensued from violent wounds of the cerebellum. One is recorded by Petit respecting a soldier, who, after a bullet had passed through the left lobe, survived forty-three hours; and the other is related by Binningerus concerning a Dutchman, who, (if no error has been committed,) lived more than four days after a small piece of bone had been extracted from its substance.

In some cases of injury of the cerebellum the consequent paralysis was on the injured side, so that a doubt arose whether the seat of the causes producing hemiplegia may not generally be found to vary from that which happens in the cerebrum.

Although there are so few examples of life being protracted after a considerable wound has been inflicted upon the cerebellum, yet every experienced

surgeon has seen instances in which there has not only been a prolongation of life after considerable wounds of the cerebrum, but even complete restoration.—*Morgagni*, lii. 27.

Disjunction of the sutures.

Case 1.

A young man was struck by a stone on the left sinciput and immediately fell; nevertheless he soon recovered, and came by himself to the hospital of St. Mary de Morte, but there were no symptoms of mischief. About twenty days afterwards, when the youth had indulged his appetite, horrible fever came on, and returned several times. Though the fever was ultimately removed, the bone remained uncovered. Subsequent to the disappearance of the febrile symptoms, cough arose, which at first was dry, but two or three days before death it was accompanied with purulent expectoration. The patient died at the commencement of the third month, without any disturbance of the intellectual faculties; but his nates had become gangrenous from long continuance in the supine position.

Dissection. At the upper part of the wound a disjunction of the sagittal suture was observed. With respect to the os parietale, there was no lesion of that part which had been denuded; but in other parts the bone was carious: indeed near the squamous suture the bones were perforated by this morbid process. The subjacent dura mater

had a somewhat livid complexion, and some osseous particles adhered to it. Immediately below this part of the dura mater, there was an abscess in the cerebral substance, but it was so small as to be scarcely adequate to receive a filbert within its parietes. It contained a thick and greenish pus. At the basis of the cranium a little serum had accumulated.

Numerous vomicæ were found in the lungs, as well as some tubercles which contained matter of a more solid consistence than that of pus. The pericardium was distended with a serous fluid.

Valsalva, li. 19.

Case 2.

A woman fifty years of age, was struck with a stick on the head whilst she was engaged in washing linen by the side of a river. The blow was given on the posterior part of the right side of the head, and the woman fell into the water. She was instantly drawn from the river, and though some stupor was the immediate consequence of the injury, yet that diminution of sensibility was of short duration, and her recovery appeared to advance daily. On the fourteenth day, however, she had an accession of fever, which was preceded by rigor; and under a continuance of these febrile symptoms she died on the twenty-second day.

Behind the right ear the serræ of the lambdoidal suture were separated from each other, and a serous fluid oozed from their interstices on slight compression. A little blood was extravasated within the cranium, at the corresponding part, but the brain itself was uninjured.—*Valsalva*, li. 25.

Case 3.

A man, upwards of thirty years of age, received a blow from an obtuse instrument, on the upper part of the lambdoidal suture, on the left side. He fell at the instant, but quickly arose and pursued his journey, a distance of three miles, and afterwards came into the hospital. At the expiration of some days an abscess formed on the side of the wound, but when this was opened the man's recovery seemed to advance satisfactorily till he had been guilty of repeated indiscretion in diet; but then febrile and epileptic paroxysms were brought on. During the remission of these attacks he did not speak, but understood every thing that was said to him. After this period convulsive motions were observed to affect the left side of the body, but on the right side he was paralytic. His face sometimes represented the sardonius risus. His pulse during a considerable part of the time was natural, but at length it became quick and full. On the nineteenth day he expired.

Dissection. On the left side of the head, in parts distant from the wound, there were collections of pus, and the os temporis was carious.

The indentations of the lambdoidal suture beneath the wound, were detached from each other. The dura mater was of a greyish colour, and pus had been deposited between that membrane and the pia mater. Part of this pus adhered to the pia mater like a thick glutinous matter: the rest was fluid, and about half an ounce in quantity. The substance of the cerebrum under this portion

of the pia mater, to the extent of two digits in length and breadth, and one in depth, had a somewhat livid hue. Within the ventricles, and at the commencement of the medulla spinalis, a little water existed,—*Valsalva*, li. 27.

Case 4.

A man, sixty years of age, falling from an eminence, struck the right side of his head, below the angle of the lambdoidal suture. For a few seconds he was stunned, but recovering himself, he complained of pain in the injured part. He did not confine himself to bed till the fourth day, on which he came into the hospital of St. Mary de Vita. The wound was so exceedingly tender that he could not even bear the contact of lint or tow in wiping it. About the seventh day he was seized with paralysis of the left arm, but this affection was partially removed by the abstraction of blood. He survived until the twenty-third day, and then died under the symptoms of lethargy.

Dissection. At the time of sawing through the skull at the right temple, pus issued from the cavity; but no injury was observable in the cranium except the disjunction of the lambdoidal suture. An abscess had formed in the correspondent portion of the cerebrum, and descended to the depth of two digits: and a small quantity of pus had been deposited between the dura and pia mater where they cover the anterior lobe of the right hemisphere. Some limpid serum was discovered in the ventricles, and at the commencement of the spinal canal.

Valsalva, li. 28.

Case 5.

A maiden seventeen years of age, when clandestinely talking with a forbidden suitor, was discovered by her father, who being naturally savage, and, unluckily, at that time somewhat inebriated, he beat her unmercifully upon the head with his stick. Four hours afterwards the unfortunate girl was brought into the hospital of St. Mary de Morte. She was incapable of replying to any questions; her pulse was feeble; there were several wounds in the scalp, and one of them, behind the left ear, was of a formidable extent. At the expiration of about four days, she was just capable, when interrogated, of saying "yes," or "no." Her pulse became strong and frequent, and she had evening exacerbations of fever. She died a few days afterwards; and it is a circumstance entitled to notice, that the menses had appeared a day or two before death, and continued to flow when this event happened.

Dissection. All the wounds had a pale and unhealthy complexion. The lambdoidal suture was somewhat opened; and behind the ear, where the wound was the most spacious, the cranium was extensively fractured, and a large portion of bone was completely detached. There were two fissures also, through both tables; and beneath one of them an abscess as large as a small apple had formed; and under the other there was slight ecchymosis of the dura mater.—*Morgagni*, lii. 28.

The sudden disjunction of the cranial bones cannot happen without considerable concussion of

the brain, nor without injury of the dura mater, which adheres more firmly at the sutures than at other parts of the cranium.—29.

It has been supposed that the sutures were partly designed to limit the progress of fractures, but I have often seen them cut across the sutures.

Injuries of the Diplöe.

It occasionally happens that when there is no fracture of the skull, nor any laceration of the meningeal vessels, the small vessels which proceed to the medulla are ruptured, and blood is extravasated; and in consequence of this injury the internal table, or both tables of the skull, become carious.

The circumstances of the following case transpired at Vienna in 1735, and the account of them was transmitted to me by Pius Nicolaus Garellius.

Fungous exostosis of the cranium.

A woman, falling backwards, forcibly struck the back part of her head against a marble step. With the exception of slight stupefaction she appeared to suffer no inconvenience at the time, nor till the expiration of some months, when she discovered a tumour about the size of a filbert on that part of her head which had received the blow. As the tumour was not painful it was disregarded; and within three years it had gradually acquired a considerable bulk. It was mistaken by several surgeons for an encysted subcutaneous tumour, in consequence of the skin retaining its natural

colour, and because no pain was felt from pressure. Soon afterwards, however, the tumour became the seat of excruciating pain; and though the pain commenced in the tumour, it extended almost throughout the cranium, accompanied with a peculiar sensation as if the head had been tightly bound with cords. These sufferings were not continual, nor were the accessions equally violent; but occasionally their severity was such as to produce some wandering of intellect. These painful attacks progressively increased in frequency and violence, till the sixth year, when on the supervention of an apoplectic paroxysm, the woman's life was terminated in a few hours.

Dissection. When the tumour was opened it was found to be nearly full of blood which was almost of a black colour, and not merely concreted but of an exceedingly dense consistence. After having removed the integuments the tumour was found to commence from the spot which, at the time the woman fell, came into collision with the step; namely, the upper part of the occiput towards the left side, and extended upon the adjacent parietal bone. Its dimension was seven digits by six. Where the bony substance was not wholly destroyed, it retained a cancellous appearance; and upon the external surface of this reticulation, bony lamellæ were here and there elevated: most of them were as thin as paper, and all of them extremely hard and acute. By this distribution of the osseous matter, an elegant structure was formed, the portions of which resembled foliated fungi of different sizes, arising from a species of bony vegetation.

The dura mater was greatly thickened where it lay beneath the diseased cranium, and adhered very closely to the part which had received the blow. On the left side the vessels of this membrane were loaded with blood, and considerably dilated; and the traces of them in the remaining sound part of the skull, were much deeper on this side than on the right. The vessels of the plexus choroides were in a state of turgescence, and there was an accumulation of serum at the basis of the cerebrum. *Epist.* lii. 38.

Garellius has in his possession a thigh bone having a tumour upon it the size of a man's fist, perforated with caries in several places, and sending forth three bony processes, the largest of which was equal to a finger in length and thickness. The foramen through which the medullary artery entered the bone, though naturally very small, was enlarged to such a degree as easily to admit the little finger. In two other thigh bones similar changes had taken place. He entertained the opinion that the vessels were in an aneurismal state. *—lii. 39.

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* The former of these cases affords an exceedingly fine specimen of fungous exostosis, originating from the diploë of the cranium; and its highly vascular structure associates it with fungus hæmatodes. The description of the latter case is too concise; but, I think we may infer, that it was an instance of cartilaginous exostosis, from the medullary membrane; and the dilated state of the medullary artery in this thigh bone, and also in the two others alluded to, resembles the enlargement of the nutrient arteries of sarcomatous and other tumours of the soft parts.—*Ed.*

Injuries of the spine.

Case 1.

Extravasation of blood into the spinal canal.

A man, fifty years of age, who stooped in walking, was struck on the three lower vertebræ of the loins by a piece of wood which fell from a considerable height. He instantly dropped like a person half dead, and was brought into the hospital of St. Mary de Vita, where he died four hours after receiving the injury.

Dissection. There was a considerable quantity of coagulated blood about the origin of the longissimi dorsi and sacro-lumbales muscles. Within the vertebral canal at the part where the stroke had been given, there was a considerable quantity of coagulated blood, but the medulla spinalis itself appeared to be uninjured. There was no apparent visceral lesion; but the arteries, in which we are accustomed to find but little blood, were full of coagula.—*Valsalva*, liv. 25.

Case 2.

Fracture of one lumbar vertebra.

Another man forty-six years of age, was struck on the back by a piece of timber. He lost the power of moving his legs, but the sense of feeling was retained. His fæces passed off involuntarily, and it was requisite for the urine to be drawn off by the catheter. Towards the close of life the urinary secretion was bloody. The patient complained of but little pain in the loins: he gradually sunk, however, and expired on the fourteenth day.

Dissection. The limbs were relaxed. Several parts of that surface of the intestines which is directed towards the loins, were of a blackish colour; and indeed the same colour was exhibited through the whole lumbar and iliac regions. Half the spleen was exceedingly livid; and one of the lumbar vertebræ was fractured.—*Valsalva*, liv. 26.

It may be difficult to account for the speedy termination of life in the former case in comparison with that of the latter; but it frequently happens that the different consequences of spinal lesions are not easily explicable. When there has unquestionably been injury done to the medulla, as, for instance, when it has been perforated by a bullet, life has been carried on for many days and even weeks. Indeed paralysis has not uniformly resulted even though the medulla had been wounded in the back. It is related of a soldier that the point of a sword, two inches in length, had passed through the twelfth dorsal vertebra, and was fixed there, exciting the most excruciating pains, but there was no consequent paralysis although the patient lived some months.

Probably some of these variations of result are ascribable to the different degrees of concussion arising from the blow, by which, independently of other serious consequences, blood might be extravasated in parts remote from the point of collision.

If the injury is inflicted upon the inferior lumbar vertebræ, of course it is the cauda equina which sustains lesion.—*Morgagni*, 27.

Dislocation of the vertebræ.

It has been a subject of controversy whether the vertebræ are fractured or luxated with the greater facility. Valsalva and myself have inspected the vertebral column after most violent blows, and though we have found the vertebræ fractured, we have never detected a luxation. If, indeed, the ligaments have been diseased, there has been an unnatural inclination of the spine to one side; but I am now speaking of displacement from external violence without any preexisting imperfection. I will not deny the possibility of this occurrence; though I do not know that it has ever been demonstrated by a *post mortem* examination that luxation has happened without the bones being broken. Many cases certainly are recorded, but they are not conclusive, because the accuracy of the dissections cannot be relied upon.*—*Morgagni*, lvi. 35.

The following is an interesting case of recovery from an injury of the beginning of this medullary process.

Case 3.

Lesion of the medulla spinalis.

A young man twenty-four years of age, received a wound from a dagger on the left side of the neck.

* The strength of the processes of the dorsal and lumbar vertebræ, and the manner in which they are locked together, as well as the strength of their ligamentous and muscular union, renders it impossible for displacement to occur without fracture; but it has been stated, on the highest authority, that dislocation of any of the cervical vertebræ is possible, though a very rare occurrence; and that it generally happens between the first and second.—*Ed.*

The point of the weapon entered about three digits below the external ear, and pursued a direction towards the beginning of the spinal marrow. Scarcely any blood was effused from the wound, yet the young man fell, and was deprived of sensibility and motion in all the parts below the head. He spoke but little, and even that was attended with some difficulty of respiration. When put into bed he complained of coldness; and to remedy this inconvenience a warming pan was resorted to, by which his legs were severely burnt without his being conscious of pain. At first he neither evacuated the bladder nor intestines; but after some days the urine flowed involuntarily. About the seventeenth day he began to have some feeling in the left side, and on the twentieth day he was able to move the fingers and toes on that side a little. On the thirty-second day he discovered returning sensation on the right side: and the degree of sensibility gradually improved, so that by the fortieth day the man had regained tolerably perfect feeling, and also considerable power of motion. Some months elapsed, however, before he was able to stand; and even then he continued more infirm on the right side than on the left; and the sensibility also of the left side was the most complete.—*Morgagni*, liii. 23.

CHAPTER II.

DISEASES OF THE THORAX.

THOUGH the parts contained in the thorax are fewer than those within the cranium, and notwithstanding their structure and functions are involved in less obscurity; yet they are so intimately united, from contiguity, connexions, or offices, that if one is injured or diseased the whole participate: and this circumstance frequently creates a difficulty in separating the primary and principal disease from those affections which are accessory. The cause of difficult respiration, however, may not only exist in the lungs and simultaneously in another part of the thorax, but the pulmonary affection may be associated with a disease exterior to the chest, and, most frequently, with disease in the head, the neck, or abdomen. Boerhaave said that there was scarcely a particle of the body which was not in a greater or less degree concerned in respiration; and consequently he was fully impressed with the difficulty which occasionally arises in determining whence the derangement of this function is derived. On this subject he says "*summam in morbis dif-*
"*ficultatem facere magnum numerum organorum, quæ*
"*ad actionem concurrunt, & quorum aliquod læsum*
"*totam functionem turbat, cum interim difficillimum*
"*sit scitu, quæ ex toto numero proprie læsa sit.*"

Morgagni, Epist. XV. *Article* 1.

The influence which passions of the mind, as well as diseases of the brain, exert on respiration, seems to have been observed by the ancient physicians; for, from the earliest period of human existence, it was remarked that this function was evidently modified by terror, anger, joy, sorrow, and weeping, though different methods of explaining these facts were resorted to.—xv. 5.

SECTION I.

Dyspnœa from causes exterior to the thorax.

Case 1.

Dyspnœa from deposition of serum in the brain.

A man forty years of age, had lately emerged from an acute attack of fever accompanied with delirium and coma; but having committed repeated indiscretions in diet, and been industriously employed in pulling hemp, he was again constrained to take to his bed. His respiration was so much oppressed, that it was necessary to elevate the neck, and even when this was done, that function was performed with great heaving of the abdomen, and wheezing in the bronchia. He spoke with difficulty, and only during expiration. He had not only some cough, but also complained of a sensation of heat in the fauces, and of pain in the parietes of the abdomen and thorax; and he was distressed with continued watchfulness. Under these circumstances he soon died.

Dissection. The abdomen and thorax being opened, all the viscera were in a perfectly healthy

state except the lungs; and nothing unnatural was observed in them except that they were unusually turgid with air, and diversified with black spots. A small coagulum was found in the heart, but with this exception all the blood was in a fluid state. When the cranium was opened, serum which presented the appearance of a gelatinous concretion, was observed about the blood vessels of the pia mater. The ventricles were filled with limpid water; and a similar fluid was observed in the upper part of the spinal canal. The compages of the brain were more flaccid than usual.—*Valsalva*, xv. 6.

Case 2.

Dyspnœa from turgescence of vessels, and flaccidity of the brain.

A woman about forty years of age, the mother of a family, was supposed by the physicians who attended her, to labour under pulmonary congestion, and died in the hospital the beginning of April 1741. During the last days of her life the pulse was languid and the face florid; but she had neither delirium nor coma. I carefully dissected the body.

Dissection. None of the abdominal viscera presented any unnatural appearances; but the left ovary contained an hydatid the size of a walnut, and there was a tumour on the fundus of the uterus. The thoracic viscera were likewise perfectly healthy. The vessels of the pia mater, and those distributed through the substance of the brain, were extremely turgid with blood; and the cerebellum was of an exceedingly soft consistence.

Morgagni, xv. 8.

As this woman had neither wandering of intellect nor lethargy, it is probable that the vessels had been accustomed to distension; and perhaps the functions of the respiratory organs were more disturbed than those of other viscera, in consequence of there being greater turgidity of the vessels at the origin of the nerves which are subservient to that process.

Cases have frequently occurred in which there was pain and spasm in some distant part; but the seat of disease was proved by examination to be in the brain, though there had been no indication of it during life. The parts which had been painful and convulsed, though subjected to careful examination, did not exhibit any trace of disease. In cases of wound, tetanic spasms are often premised by a pain in the pharynx; but it is unquestionable that the cause of the pain and convulsion was not in the pharynx, but in the wound. Therefore, although when respiration becomes difficult from an affection of the nerves, the source is distinguished with greater facility if the patient complains of the head, whilst the symptoms of other causes are absent, yet it sometimes happens that the disorder arises from an encephalic lesion, without any intimation whatever.—9.

But respiration may be disturbed by acute pain in any part of the body, through the influence of nerves, when it may not be ascribable to irritation in the brain. Through the same medium the pulmonary action is disordered in hypochondriasis and hysteria; and orthopnœa arising from renal calculi has been accounted for in the same manner.—10.

If the stomach or contiguous intestines are inflated with gas, the distension will prove an impediment to the descent of the diaphragm in the act of inspiration. This effect will also be produced by an enlarged liver; and the augmented weight of this viscus will also impede the ascent of the septum, to which it adheres. Nor are examples wanting of dyspnœa from the enlargement of other viscera.—11.

The following case, in which asthmatic symptoms were occasioned by a diseased pancreas, was related to me by Albertini.

Case 3.

A person at Genoa was afflicted with asthma, and his physicians entertained no doubt that the cause existed in the thorax. When Albertini was consulted, he suspected that it originated from lesion in some abdominal viscus near the diaphragm. At length the patient died, and, on examination, the pancreas was found to be the seat of tumours having the form of apples and inclining to the nature of carcinoma.

The cases of this description which have occurred to Valsalva and to me will be adduced in another part of this work, and amongst them some will be recorded in which the utmost difficulty of respiration was consequent upon an apparently slight disease of the stomach.

Physicians do not sufficiently bear in mind the circumstance, that the upper part of the abdomen and consequently its higher viscera ascend high within the chest, and consequently those symptoms

which relate to the abdomen are very often ascribed to the thorax.—11.

The causes of dyspnœa which exist in the neck operate by irritating, obstructing, or compressing the larynx or trachea. The most frequent sources of them are foreign bodies falling into these parts, or tumours growing in contact with them; but a similar effect is not unfrequently produced by inflammatory affections of the larynx and trachea, ulceration or thickening of the arytænoid cartilages, and sometimes from a dislocation of the cartilages of the larynx, and of the os hyoides.

Case 4.

Cynanche laryngea.

A carpenter thirty years of age, having taken cold was seized with angina. Though repeatedly bled—his fever, anxiety, and difficulty of swallowing, speaking, and breathing, continued to increase. The blood withdrawn did not exhibit an inflammatory crust, but it was dense; and only a little serum was disengaged from the crassamentum. The man's neck was tumid, and he died on the third day, in the act of using a gargle.

Dissection. The vessels on the surface of the cerebrum, and here and there in its substance, as well as upon the membrane of the ventricles, were distended with blood; but the left side of the pia mater was more vascular than any other part. This membrane, and indeed all the other membranes of the body, resisted the knife more than usual. The lateral ventricles contained a little water.

The tongue appeared as if it were thickened;

the vessels, at least, which proceed from the base of this organ towards its apex, were manifestly enlarged from remora of blood. The uvula and velum palati were not diseased. The membrane of the tonsils was thickened by the deposition of a yellowish jelly-like serum, and the tonsils themselves were swollen, especially the left; which also was indurated, and when squeezed, or cut into, pus was discharged from it. The cartilages and muscles of the larynx were in a healthy state; but the investing membrane of this part, and of the adjacent portion of the trachea, was of a red colour and slightly thickened. Where the membrane covered both surfaces of the epiglottis, it had in some places a florid hue, and in others it was brownish and tumid. On cutting into it, the colour and tumefaction were discovered to have arisen from blood and serum, with which the membrane and the glandular bodies connected with it were distended. On the convex surface of this cartilage, suppuration had commenced. That portion of the membrane which descends at the posterior part of the larynx, and the glandular bodies which it envelops, had been the seat of high inflammatory action; and, on each side, the membrane was raised into a protuberance equal to the thickness of a man's little finger. These protuberances originated from the basis of the cricoid cartilage, and converging as they ascended, proceeded so far as somewhat to exceed the heighth of the arytænoid cartilages, but were not connected with them. They consisted of the membrane with its glands, rendered turgid by the accumulation of blood and serum: the

larger quantity was on the left side, and this coincided with the more diseased tonsil, and the vascular plenitude of the pia mater.

The pericardium contained a little reddish fluid, the heart was large, the surface of the aorta was of a brownish red colour, and was somewhat uneven from small white excrescences. The parietes of this vessel were hardened.*—*Morgagni*, xliv. 3.

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* Whenever the mucous membrane of the larynx or of the trachea is the seat of inflammation the most dangerous consequences ensue. But the larynx is occasionally the seat of a spasmodic affection, during which a train of symptoms arises, similar to those that characterize the inflammatory disease, and which may lead to a most injurious plan of treatment. The discrimination of these cases is sometimes exceedingly difficult; but nervous and susceptible persons, and particularly hysterical females, are most liable to the spasmodic affection: and, as far as my own observation has extended, there are remissions in the paroxysms, which in suddenness and degree have no parallel when the symptoms arise from inflammation.

In a fine boy eleven months old, that recently died suddenly from a spasmodic affection of the larynx, I found the membrane covering the epiglottis in a state of slight ulceration. He had repeatedly undergone similar attacks, but had been free from them for a fortnight, and appeared quite well on the day of his death, till in the act of struggling to get from the mother's lap, and beginning to cry, the fatal event occurred. The mesenteric glands were exceedingly enlarged; the vessels in the pia mater were turgid, especially in that process of it which lines the ventricles; the tunica arachnoides was elevated by a subjacent fluid; and the substance of the brain was very soft. Though I have often seen the disease, this is the only instance in which I have known it fatal. One of my own children was severely affected with it; for during a period of twelve months, whenever his bowels were in an unnatural state, the irritability of the larynx was so excessive that either laughter or crying produced a spasmodic constriction of that organ, threatening suffocation; and leaving him in a most feeble state for some hours.—*Ed.*

Case 5.

Ulceration of the larynx.

A woman forty years of age, had long been asthmatic. She also had purulent expectoration, and a sense of erosion in the larynx, in combination with weakened powers of voice; and was supposed by her physician to be the subject of pulmonary disease. At length, in the year 1704, she was seized with an urgent paroxysm of asthma, and died suddenly.

Dissection. To the astonishment of those who were present, no disease was found in the abdomen, thorax, or head. At that time it was not usual to open the larynx in public demonstrations, but I suggested to Valsalva that the disease might be lurking there. This organ was then opened, and the object of our inquiry discovered. Pus of a somewhat cineritious colour, and of a pultaceous consistence, formed into the shape of a cork, closed the cavity of the larynx below the glottis. The investing mucous membrane at that part was in a state of ulceration; and it was slightly ulcerated also where it lined the adjacent rings of the trachea. The discovery of this seat of the disease, afforded great satisfaction to all the persons who attended the public dissection.*—*Morgagni*, xv. 13.

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* In a case of ulcerated larynx, recently under my care, the most distressing circumstance during the disease was an inability to swallow liquids without a sense of suffocation, and most acute pain being induced. Persons whose misfortune it is to labour under ulceration of the epiglottis, or who have tumours of the larynx or pharynx, are often called to undergo extreme suffering.

I am indebted to Mediavia for the following case.

Case 6.

Dyspnœa from a suppurated tumour behind the trachea.

A woman upwards of eighty years of age, had complained, for several days, of difficulty of breathing and swallowing, attended with a sensation of heat of the fauces, when she was received into the hospital at Padua. Whilst there, she was seized with so violent a paroxysm of dyspnœa that she had nearly been destroyed by it. She recovered from the attack, but it was followed by the spitting of fetid and bloody pus. She pointed to the larynx as the seat of disease, and by drawing it forwards with her fingers she could respire more freely. The aperture of the fauces appeared more expanded, and of a redder hue than usual. Respiration became more difficult, and she yielded to a fatal destiny about the beginning of September 1725, fifteen days after the first appearance of purulent sputum.

Dissection. At the posterior part of the trachea, and about the distance of a finger's breadth below the cricoid cartilage, a tumour had grown to the size of half a walnut. It in some degree compressed the œsophagus, but more particularly the trachea, so that the caliber of this pipe was narrowed to an oblong fissure. The cavity of the tumour was

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Some cases of this description will be adduced when speaking on the subject of impeded deglutition. Morgagni has mentioned serous depositions from inflammation as a cause of dyspnœa, but he does not appear to have distinguished the effusion of coagulable lymph as in cases of cynanche trachealis.—*Ed.*

filled with putrid matter. Its parietes internally were hard, and externally were constituted of yellowish granules like millet seed. Two contiguous glands, each as large as a pea, presented a similarly granular appearance, from which circumstance it was inferred that the tumour had originated from a gland like them.

Morgagni, xv. 15.

Dislocation of the cartilages of the larynx, and of the os hyoides.

In a case of impediment to deglutition, an attempt was made to account for the phenomena by attributing them to spasm of the hyoidei muscles; but the history is not given with adequate precision, because the muscles in this part are numerous, and perform offices directly opposed to each other. Not only may the os hyoides and larynx occasion the difficulty alluded to, but likewise those parts which are connected with them, if considerably diseased. Valsalva has related a case in which this occurred from luxation of the superior appendages to that bone; and Boerhaave, on the authority of Cowper, reported an instance of similar obstruction from the luxation of the cartilages of the larynx, which I suppose was the displacement of the thyroid from the cricoid.*

Morgagni, xxviii. 14.

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* Morgagni has exclusively associated these cases with impeded deglutition, but they are equally injurious to respiration. I am sanctioned in this opinion by the following instance of luxation of the os hyoides. A few years ago a respectable and intelligent dissenting minister, not enjoying good health, was seized, whilst

Difficult respiration has likewise been produced by worms in the œsophagus; and from that tube they have sometimes perforated the trachea.

Though pressure from behind more readily obstructs the trachea than when it is made anteriorly, because the posterior surface is not defended by cartilage; yet if the anterior part is powerfully compressed, not only may difficult respiration ensue, but even death. This has actually occurred from sarcomatous tumours; and Christian Vater has related an instance in which it happened from the thymus gland being enlarged and filled with calcarious matter.—16.

Cough has likewise been occasioned by some of these causes of dyspnœa. It is well known that a sympathetic cough may be produced by some affections of the head, probably from irritation at the origin of the nerves. In persons labouring under hydrocephalus it sometimes occurs, and may be referred to this source. An instance is recorded by Vesalius in which slight motion of the head occasioned violent coughing, but no affection of the lungs is mentioned. In a case by Lechelius, in which there was cough, no organ besides the brain presented morbid appearances. The lungs are expressly said to have been in a natural state.

Morgagni, xix. 54.

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preaching, with an imminent sense of suffocation from some mechanical obstruction in the larynx. He descended from the pulpit, and surgical aid was instantly obtained. On examining the neck one of the rami of the os hyoides was found projecting. The bone was replaced by a sudden jirk, and respiration immediately became easy. This accident repeatedly happened to him, and on that account he was led to abandon ministerial duties.—*Ed.*

Diseases of the abdominal viscera, especially in the liver and stomach, are a fruitful source of this affection. Those viscera which are contiguous to the diaphragm, as the liver and stomach, may produce it, through the medium of that septum, by mere contact, or in consequence of the peritoneum being implicated in the visceral disease; because this membrane is common to the viscera and to the lower surface of the diaphragm: or the lungs may be sympathetically affected through the medium of the nerves. In a case of tumour, a pound in weight, annexed to the stomach, dry cough, difficulty of breathing, and continual pain in the head, with watchfulness and loss of appetite, had been the prominent symptoms. The patient had not complained of any hardness, swelling, or sense of weight in the abdomen.—56—58.

SECTION II.

Diseases of the Lungs.

Peripneumony and Pleurisy.

The most frequent structural lesion consequent to inflammation of the lungs which occurred to Valsalva and Morgagni, was consolidation; so that the texture of the inflamed portion acquired the appearance of solid flesh. In some instances this consolidation, and adhesion of the pulmonary to the costal pleura, were the only morbid appearances discovered after death. Of the following cases, those first adduced will elucidate this result of inflammation; afterwards those will be successively

brought forward in which there was consecutive suppuration, or effusion of serum; or in which there was a complication with other diseases.—*Ed.*

Peripneumony terminating in consolidation of the pulmonary tissue.

Case 1.

A man forty years of age, who, for a long period, had been in the hospital of St. Mary de Vita, in consequence of a wound of the leg, was seized with cough and acute fever. The sputum was at first tinged with blood, but afterwards it was of a colour inclining to green. He had considerable difficulty of respiration, and severe pain in the right side; nevertheless he could lie easily on that side. About the fourth day from the commencement of active symptoms he died.

Dissection. The upper lobe of the right lung, and the contiguous part of the adjoining lobe, were tumid and greatly indurated, and also adhered closely to the pleura by interposing membranes. The pleura itself did not exhibit the least sign of inflammation.—*Valsalva*, xx. 3.

Case 2.

A man about sixty years of age, was seized with pain in the right side of his thorax, which was accompanied with fever, cough, and expectoration. He could lie most easily on his back. The quantity of sputum had been considerable, but on the tenth day, after the loss of blood, expectoration ceased, and the man died.

Dissection. The pleuræ on the left side of the thorax were universally conjoined, but the texture of this lung was perfectly natural. The right lobe, on the contrary, was unconnected with the costal pleura, but the posterior part of it had been highly inflamed, and its structure resembled that of solid flesh.—*Valsalva*, xx. 22.

Case 3.

A man about forty years of age, was seized with pain in the thorax, accompanied with difficulty of respiration. At the commencement of this affection he lay most easily on the right side, and afterwards on the left. He required his neck elevated to respire. He expectorated freely, but died on the tenth day.

Dissection. The pleuræ on both sides were coherent, but could be disjoined without laceration. Towards the back the lungs had been highly inflamed, and were extremely hard.—*Valsalva*, xx. 24.

Probably the right side was most severely affected in the beginning of the man's illness, and afterwards the left; but when they became equally oppressed by disease he could only respire by sitting upright.—*Morgagni*, 25.

Case 4.

On the 20th of December 1689, a man fifty years of age, was seized with difficulty of respiration, which appeared to have arisen from catarrh. His illness gradually increased, so that by the 22d of January following he was unable to leave his bed. His voice was clangous; he expectorated a

considerable quantity of a watery fluid; his respiration was extremely difficult, and was attended with a sensation in the fauces like strangulation. He could not lie on either side without an increase of the distress, but especially on the left; and, at length, he could merely be said to pant, and even this privilege was only obtained by sitting upright. After this the sputum became more viscid, and the poor fellow breathed with greater freedom, but the sense of suffocation remained. The febrile symptoms, during the whole progress, were but slight. He died on the 12th of February.

Dissection. The right lobe of the lungs deviated but little from its natural state, but the left adhered universally to the costal pleura, without any intervening membrane. Its substance had evidently been the seat of inflammation, and had become indurated.

The spleen had contracted morbid adhesions to the adjacent parts, and its arteries were cartilaginous. An hydrocele was observed on the right side of the scrotum, and when some of the aqueous fluid it contained was placed over a strong fire, it coagulated; but on being exposed to a more gentle heat it was gradually evaporated, leaving behind it some traces of lymph.—*Valsalva*, xx. 26.

Case 5.

A builder about thirty years of age, after laborious exertion, was seized with fever. He was affected with quotidian rigors; and, at length, these febrile paroxysms were accompanied with delirium. The wanderings of intellect, from being periodical, became a continued delirium, of a

melancholy and querulous form. He was sometimes affected with epistaxis. His pulse was equal, and blood was repeatedly withdrawn; but notwithstanding this the disease progressively advanced, and proved fatal. The body was opened nine hours after death.

Dissection. The body retained a degree of warmth, and warm and fluid blood issued from the veins. The whole of the lungs, except the anterior part, was of unnatural hardness; and on the right side, especially in the upper lobe, this viscus was indurated, heavy, and turgid; and was of a red colour, and of a dense and compact texture. The spleen was enlarged.—*Morgagni*, xxi. 6.

When delirium is united with peripneumony, which is by no means a rare occurrence, nothing can be ascertained relative to the nature and seat of pain. Other conditions of the brain and nervous system in which there is dulness of sensation, prevent the perception of uneasiness in the inflamed viscera. Under these circumstances, the symptoms occasionally appear so slight, or are so obscure, that the existence of the disease has been rendered doubtful even when a fatal termination was at hand. *Morgagni*, 7, 8.

Case 6.

Francisco Coralli, an old native of Bologna, had been labouring under a catarrhal affection, but of so mild a character that he had not applied for the advice of his physician; and he had so far recovered as to purpose leaving his house; but his servants thought it premature and requested Valsalva to

call and dissuade him from his purpose. When Valsalva called the following morning he discovered indications of approaching death, contrary to the opinion entertained by the persons in attendance. He privately informed them, that although their master experienced neither heavy nor acute pain in the chest, but appeared to himself tolerably well, yet he was the subject of inflammation of the lungs to an imminently dangerous degree. The prediction was verified, for in twelve hours he died.

Dissection. The upper lobe of the right lung was tumid, indurated, and in a state of sanguineous infarction.—*Morgagni*, xxi. 11.

When I expressed to Valsalva my surprise that the patient had not been conscious of a sense of weight from the pulmonary infarction, he informed me that he had known an instance of a leaden bullet's lodging in the lungs without occasioning that sensation, even though the bullet was full two ounces in weight. He did not communicate to me the symptoms which led him to the diagnosis and prognosis in the preceding case, but I apprehend that a similar instance occurred in the person of the celebrated Professor Anthony Vallisneri, whose death was to me a source of deep and lasting regret.

12.

Case 7.

During a mild epidemic of catarrhal fever, Vallisneri was seized with the disease on the 12th of January 1730. He was sixty-nine years of age, but the attack assumed a mild aspect, and on the fourth day, when I called to congratulate him on his convalescence, I found him sitting up in bed, after

having taken nourishment. His countenance, respiration, voice, and other circumstances of that nature, were as they appeared to be during health. He coughed but little, and expectorated with facility. His tongue was white, and somewhat viscid. His pulse was equal, and of moderate fulness and strength, though a little slower than ordinary. On the following day I was informed that he was still more cheerful, and had dictated a letter to a friend; but on the sixth I called, and found him in widely different circumstances. His face was discoloured and dejected; his respiration was difficult; his voice languid, and had somewhat the sound of reverberation from a cavern. The sputum was small in quantity, but thick and tinged with blood. But, notwithstanding these circumstances, he considered himself as well as he had been when I saw him two days before. Nay he concluded that he was even better; and when I inquired if he felt any sense of weight, any pain or heat in the thorax, he expressly affirmed that he felt none; he only mentioned an uneasiness on the left side of the thorax externally, but that he considered of no importance. He was thirsty, though his tongue, skin, and pulse were in the same state as on the fourth day. I intended to conceal my anxiety respecting the exigent circumstances of the patient, but it was betrayed in my countenance. He informed me that from the age of sixty his pulse had been intermittent, but during some days it had beat with regularity. Within twenty-four hours this worthy man expired.—*Morgagni*, xxi. 13.

There was no doubt that this was a case of inflammation of the lungs, which was the more dangerous

on account of its progress being insidious; so that when discovered it was impossible to avert the fatal catastrophe.

Other cases of this nature clearly manifest that slowness of the pulse is not incompatible with the existence of inflammation in the lungs. It is probable that the symptoms are modified by the various conditions of the blood, of the body, and especially of the lungs themselves, and the different degrees in which sanguineous congestion takes place in them, so that sometimes all, or (as it generally happens) most of the leading symptoms occur. Sometimes, however, scarcely any of the ordinary signs appear; indeed those symptoms which do exist may be in opposition to them; as, for example, when the pulse is slow. Occasionally there is acceleration of pulse, without any symptom which directs attention to the lungs as the seat of disease, though after death some of the lobes have been found inflamed and consolidated.—14.

Peripneumony terminating in suppuration.

Case 1.

An old woman who had a cancerous ulcer of the mouth and tongue, and who was subject to a catarrhous affection, died under the symptoms of suffocation.

Dissection. Immediately below the glottis, and in the adjacent part of the trachea, the inner membrane was pervaded by a purulent fluid; and a similar secretion occupied the upper lobe of the left lung, and the inferior lobes were extremely inflated. Wherever the lungs were cut into they

displayed a cineritious colour, interspersed with black lines, and ramifications of small and turgid blood vessels. The coronary veins of the heart, as well as the jugular and other veins in the neck, were greatly distended with blood. One of the aortic valves was beginning to ossify, and a similar degeneracy had commenced in several parts of the inner surface of the same vessel, throughout its course.

Morgagni, xix. 49.

CASE 2.

A carman about fifty years of age, had laboured under febrile symptoms for a year, without any remission of his usual employment. He was at length seized with inflammation of the lungs, accompanied with dry cough, difficulty of breathing, and slight delirium; but he did not come into the hospital till five days after the attack. He died in twenty-four hours.

Dissection. The abdomen contained a small quantity of limpid serum, and the spleen was enlarged to thrice its natural size. In the right cavity of the thorax there were some ounces of turbid serum, and the upper lobe of this lung was inflamed, and when cut into exhibited numerous small abscesses. The pericardium was half filled with a serous fluid.

Valsalva, xx. 2.

CASE 3.

A man sixty-five years of age, was received into the hospital of St. Mary de Vita, on account of inflammation of the lungs. He suffered considerable pain, and a sense of weight in the left side of the thorax, and had purulent expectoration. On the twenty-third day the expectoration ceased, and

he died suddenly. Two years before, this man had been seized with paralysis of the right arm; but though he often complained of headach, he had regained the use of the limb.

Dissection. The left lung was indurated, and so tumid as to fill the whole cavity. It contained an abscess, and a purulent fluid was diffused through the greater part of this viscus. The pleura was not implicated in the disease. The ventricles of the brain were distended by at least half a pint of fluid, and the glandules of the choroid plexuses were greatly enlarged.—*Valsalva*, xx. 5.

Case 4.

A noble matron forty-five years of age, of a serous and corpulent habit of body, had some difficulty of respiration, especially after exercise, even when in tolerable health; and often, this was accompanied with slight cough, and frequent expectoration; and generally, after passing a restless night, she vomited some viscid matter in the morning. She had borne several children, and was in the ninth month of pregnancy, when, after protracted exposure to a cold atmosphere, she was seized with universal rigor, followed by heat of skin, excessive thirst, difficult breathing, troublesome cough, and an oppressive pain in the left side of the thorax inclining towards the scapula. The pulse was frequent, quick, and hard; she had bilious vomitings and great inquietude, with tossing of the body. Though she was bled, and though other appropriate measures to subdue inflammation were resorted to, she experienced a still more urgent

paroxysm of the disease. On the second day the pulse became intermittent, and on the third, respiration was stertorous as well as oppressed. The sputum decreased in quantity, and became very thick and dense; and its colour was sometimes white, and at others of a yellow aspect. The alvine excretions were frequent, and the pulse was more unequal than before. Under these circumstances bleeding was again employed.

On the fourth day all the symptoms were aggravated; and the pain at the chest, which had previously been obtuse, became acute and lancinating, especially during the effort of coughing, or any movement of the body. In addition to the sufferings already detailed, this noble lady had now to endure pain in the lower part of the abdomen; but on the beginning of the fifth day the powers of life became extinct.

Dissection. The abdomen was immediately opened, but the child was dead. The uterus was slightly inflamed. The right lung evinced traces of high inflammation; it had acquired unnatural hardness, and an abscess had begun to form in its texture.—*Valsalva*, xx. 9.

Case 5.

A maiden lady forty-five years of age, was seized with pain in the thorax, especially about the sternum, accompanied with fever, headach, difficulty of breathing, and copious expectoration. Diarrhœa supervened, and all the symptoms were exasperated; and the difficulty of breathing became so extreme that she could only respire

with the neck in an erect position. She died about the ninth day.

Dissection. The gall-bladder was dilated with bile, and both the ovaries were greatly indurated.

In the left cavity of the thorax the pleuræ were found united so closely that it was impossible to disjoin them without laceration. On the right side, the lungs adhered firmly to the mediastinum, as well as to that part of the pleura which invests the upper ribs; and, on attempting to detach them, they were torn in consequence of their extreme rottenness; and a large quantity of pus was at the same time discharged from an abscess which had formed in the texture of this organ. The pericardium was full of serum.—*Valsalva*, xx. 11.

Case 6.

A woman sixty years of age, was seized with acute pain in the right side of the thorax; and on that side she was unable to lie down. She had a troublesome cough, with which however she expectorated but little: and these circumstances were accompanied with slight difficulty of respiration, and with great prostration of strength. After a time she experienced such alleviation of pain as to be able to lie on the affected side without inconvenience; nevertheless her pulse daily sunk till she died.

Dissection. On both sides of the chest the pulmonary and costal pleuræ adhered together; but on the right side the union was more firm than on the left. The whole of the right lung was indurated, but the upper part was harder than any other; and there an abscess had formed, which had

involved the adjacent parts of this organ in circumstances of sphacelation. The posterior part of the left lobe was inflamed, and the remaining surface was diversified with black spots. The pericardium contained an abundance of serous fluid. The coats of the spleen, in one part, were converted into a spherical bony substance.—*Valsalva*, xx. 41.

It is easy to be conceived that the remission of pain already detailed, occurred when suppuration had taken place, and when the inflammation began to degenerate into sphacelus; and this circumstance has often deceived physicians, and has thrown discredit upon their judgment, in not directing adequate attention to other symptoms.—*Morgagni*, 42.

Case 7.

A slender woman sixty years of age, was seized with violent fever, dry cough, and a pungent pain of the left side; but when she was recumbent on that side, she experienced but little pain. By the abstraction of blood the pain was so greatly mitigated that she was capable of lying in any position. The febrile symptoms and thirst, however, continued to be urgent, and the sputum was occasionally of a thick consistence. The respiration became more oppressive, and the patient died on the thirteenth day.

Dissection. The left lung was entirely free from adhesion. It was of a whitish colour, diversified however with black points; and its texture was of a fleshy hardness, and contained tubercles in a state of suppuration. The upper part of the left lung adhered to the costal pleura, but was less diseased

than the opposite; nevertheless, adjacent to the throat, its structure was indurated, and this portion was occupied by a small abscess.*

Valsalva, xx. 49.

Case 8.

A woman upwards of sixty years of age, of a plethoric and corpulent habit, was seized on the first of December, with pain in the thorax, particularly on the right side, accompanied with violent fever, excessive thirst, soreness, and lassitude of the whole body, and painful respiration. Bleeding and other suitable measures were resorted to, but they were ineffectual. The lassitude increased; the mind became torpid, and slightly erratic. At length the sputa were thrown up in a globular form, and were of a purulent quality; respiration became increasingly laborious; delirium ensued; and the patient died on the eighteenth day.

Dissection. The right lung was found attached to the costal pleura; and whilst separating them a large quantity of pus burst from an abscess in the substance of the lung. In the circumference of this

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* This is a paradigm of cases which are by no means unfrequent. Within the parenchymatous structure of the lungs, tubercles are developed, and often advance by almost imperceptible degrees till a considerable portion of the viscus is disorganized and rendered useless. Then, perhaps, there is an unexpected accession of acute symptoms, which is usually ascribed to the agency of external cold; and this opinion may be sanctioned by the symptoms having a peripneumonic character. But this conversion of the disease into an active form may arise from its own extension, or from any of those fortuitous occurrences which tend to excite the system, and to disturb the quietude of latent and chronic disease.—*Ed.*

abscess there had been high inflammation, yet the pleura was unaffected.—*Valsalva*, xx. 61.

Not only in this case, however, but in others also it will appear that considerable pain has attended inflammation of the lungs, although the pleura had not partaken of the disease.—*Morgagni*, 62.

An epidemic inflammation of the lungs prevailed among the poor at Padua, in the winter of 1738; but its severity was particularly felt in some convents of nuns. In one of these religious houses, such was the fatal tendency of this epidemic, that all who were seized with it died, and some within four days. After it had proved fatal to nine, who had been attended by different physicians, I was solicited to inquire into the nature of the disease by dissection, which I did in the following instance. *Morgagni*, xxi. 26.

Case 9.

A young woman twenty-two years of age, who every winter had been subject to violent cough, but whose general health was unimpaired, having been employed in constant and laborious servitude in the convent, was seized in the night with pyrexia, which commenced with general coldness, succeeded by heat. At the expiration of twenty-four hours, or nearly so, pain on one side of the thorax, difficulty of respiration, and an irritating cough, were superadded to the febrile symptoms. The pulse was somewhat hard, and resisted the pressure of the fingers almost to the period of dissolution. In the progress of the disease the pain was translated to the opposite side of the chest. A sense of

oppression was experienced within the thorax, and the patient was unable to lie on either side. The serum of the blood, which had been taken from her repeatedly, was of a greenish colour: the surface of the crassamentum was incrusted, and the remainder was dense and black. She died on the beginning of the seventh day.

Dissection. There was no effusion into the thorax, nor was there any adhesion between the pleuræ except on the left side, where indeed it was but slight. This lung was covered with a whitish and rather thick adventitious membrane, and when pressed upon to separate its adhesions, a quantity of turbid serum escaped either from the lung itself, or from the interstices between it and the costal pleura. In another part of the thorax where there had been no adhesions, the lung was raised into a kind of tubercle; and when this portion was divided a whitish matter flowed from it, which resembled pus. In other places the texture was as hard and compact as liver, and abounded with that whitish matter which I have described as being in the tubercle. It was evident from these circumstances that inflammation in both lobes of the lungs had ended in suppuration.—*Morgagni*, xxi. 27.

Case 10.

Empyema; the pulmonary cells enlarged.

A man who apparently had recovered from a febrile affection, began again to complain of thirst, with a sense of oppression at the middle of the thorax, and such difficulty of breathing that he

could respire only when his neck was elevated. He was unable to lie upon the left side.

Dissection. On examination after death he was found to have empyema, and the pus filled the left cavity of the thorax. The upper lobe of the left lung was somewhat indurated; and towards the clavicle, the cells of which this organ consists, were enlarged to an astonishing degree; and indeed some of them were equal in size to a filbert. Some of them were globular, others were of an oval or oblong figure; and they were all full of air, and, outwardly, were supplied with blood vessels. One of them exhibited small foramina opening upon the internal surface.*—*Valsalva*, xxii. 12.

Peripneumony terminating in serous effusion into the thorax or pericardium.

Case 1.

A woman about twenty-seven years of age, was attacked with pain of the left side of the thorax, difficulty of breathing, violent cough, with some expectoration; and she died in consequence of these affections. She had been married four years, but the uterus had never become pregnant.

Dissection. The left cavity of the thorax contained a quantity of a whitish serous fluid, and the posterior part of the lungs was inflamed; and although there was no apparent abscess in the structure of

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* The pus in this instance might have been secreted by an inflamed membrane; but it often accumulates in the thoracic cavities from abscesses in the substance of the lungs. The enlargement of the air-cells is a rare occurrence. It is effected by the septa of contiguous vesiculæ being broken down.—*Ed.*

this viscus, yet when it was divided sanies as well as blood escaped from the section; and black spots were distinguishable. The fluid of the ovarian vesicles was concreted as if it had been submitted to the action of fire; and possibly it was from this circumstance that sterility had resulted.

Valsalva, xx. 7.

Case 2.

A butcher about fifty years of age, was seized with pain in the right district of the chest, and at the middle of the sternum. He lay supine, but sought alleviation to his breathing by the erection of the neck. He had a troublesome cough, and expectorated but little. He died on the seventh day.

Dissection. The upper part of the right lobe of the lungs was indurated, and adhered slightly to the sternum, but much more firmly to the mediastinum.

The posterior part of the left lobe was of a black colour. A small quantity of serous fluid was effused into the left thoracic cavity, and the pericardium was filled with a similar deposition The blood retained a degree of fluidity.—*Valsalva*, xx. 13.

Case 3.*

The subject of this case was a clergyman twenty-three years of age.

Three years before the illness of which I am about more particularly to speak, he underwent an

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* In this and the following case it is not improbable that there had been some effusion of serum into the chest previous to the last attack of inflammation. The first indicates the difficulty which there occasionally is, in discriminating between pneumonitis and hepatitis.—*Ed.*

acute febrile affection, attended with swelling of the parotid glands; and when he recovered from that disorder he became the subject of tertian ague, which ceased, after a long continuance, but left him pale and somewhat emaciated, and liable to occasional difficulty of respiration. His nights were frequently disturbed, and his urine was almost constantly of a red colour. At length acute fever was united with these symptoms, and on the second day afterwards he complained of pain below the left spurious ribs, and also beneath the ensiform cartilage; and the pain was aggravated by pressure. On the first days there was vomiting and diarrhœa; the cough at the beginning was humid, but after a few days it became dry and irritating. He had difficulty in decumbiture on either side, so that he only lay upon the back. He experienced a sensation of heat in the loins corresponding with the situation of the right kidney; and his pulse was quick, weak, unequal, and intermittent. Valsalva had some uncertainty of mind respecting the seat of the disease, yet as the patient discovered no pain in the thorax, but always pointed to the region of the liver, it was finally supposed to be a case of hepatitis. The oppression of breathing and the other symptoms daily increased in severity, and on the seventh day he died.

Dissection. Whilst inspecting the body Valsalva ingenuously acknowledged that he was convicted of an error of judgment; for all the abdominal viscera were in a natural state except the spleen, which was enlarged to four times its usual size. The left cavity of the thorax contained about two

pounds of limpid serum, and the right was filled with a more turbid fluid, in which portions of a membraniform concretion floated. There was no adhesion between the pleuræ, but the whole of the right lung was greatly indurated from inflammation. The pericardium was exceedingly distended with fluid.—*Valsalva*, xx. 30.

The circumstance that a portion of the lungs which is situated behind the liver had been the seat of inflammatory action, elucidated the deception as to the organ affected, and also accounted for the sensation of heat in the back.—*Morgagni*, 31.

Case 4.

A girl sixteen years of age, was cachectic, and the menses had been suppressed for eight months. She had some catarrhal expectoration, and experienced a degree of difficulty of respiration, with a sensation of heat and uneasiness in the thorax, on the left side. At length she was unexpectedly seized with a laborious orthopnœa, so that she could not assume the recumbent position. The sputum, which heretofore had been purely mucous, became bloody; and she felt an oppressive weight in the left side of the chest, having, at the same time, a hard pulse, and coldness of the extremities. On the fourth day from the beginning of the orthopnœa, the attack proved fatal.

Dissection. Both cavities of the thorax contained limpid serum; and after this fluid had been allowed to stand at rest, it exhibited a concretion in the middle, which was separate from the rest of the fluid, and resembled jelly. And when some of

the same liquid was placed over the fire, it coagulated in a similar manner to the serum of the blood. The whole of the left lung was extremely hard. The gall-bladder was very small, and retained only a slight trace of bile; but its coats were thickened. *Valsalva*, xx. 32.

CASE 5.

An old man seventy-four years of age, was seized with pain in the right side, but which incommoded him rather by the sensation of weight which it produced, than in any other way. His uneasiness was increased when he lay on the opposite side. The pain was accompanied with a troublesome cough, bloody expectoration, headach and watchfulness. At the commencement the fever was extremely violent, and the pulse was hard and frequent, but not very full. He died on the third day.

Dissection. The right side of the thorax so abounded with a serous fluid, that it burst forth as soon as we had punctured this cavity. The lung on this side was black, inflamed, hard, very compact, and its external coat was easily susceptible of disjunction from the pulmonary tissue. The pleuræ, towards the scapula, were conjoined by small membranes. The left lung had scarcely sustained any lesion. —*Valsalva*, xx. 33.

In the four instances immediately succeeding, the peripneumony was complicated with *pericarditis;* and in the first two an excessive redundance of serum was accumulated in the thoracic cavity. In the sixth and ninth cases, the pericardium was thickened; and in the tenth, it was cartilaginous.

Case 6.

A young man nearly twenty-four years of age, was seized with a piercing pain in the left side of the chest, accompanied with difficulty of breathing, dry cough, and excessive thirst. He lay on the affected side, and experienced some alleviation of his distress by inclining the head forwards. The difficulty of respiration, however, daily augmented; and the patient died on the sixteenth day.

Dissection. The left lung was universally inflamed, and very intimately united to the adjacent parts. In a portion near the clavicle, suppuration had taken place.

The pericardium was greatly distended with fluid, and its parietes were much thickened. To the inner surface of this membraneous bag, and also to the surface of the heart, white concretions adhered in several places. The heart was enlarged, and its ventricles contained some fluid blood.

Valsalva, xx. 35.

Case 7.

Another young man about twenty-two years of age, at first complained of an abdominal pain, which afterwards subsided; and then he was attacked with pain in the thorax, attended with oppression of breathing, cough, and troublesome thirst. He constantly lay in a prone posture, but with an inclination to the right side; and his head was bent forwards as is usually done when the pericardium is greatly dilated with fluid. All the symptoms progressively increased in violence, and

proved destructive to life about the sixteenth day, as it had happened in the preceding instance.

Dissection. There was an accumulation of limpid fluid in the left cavity of the thorax. The right lung, however, was indurated, and annexed to the neighbouring parts, but more particularly in the region of the scapula. In this part there was fluid like whey, and such concretions floated in the fluid as bore a resemblance to the white of an egg coagulated in hot water. The pericardium was greatly distended with a similar fluid, and was pervaded by the same kind of concretions, some of which also adhered to the inner surface of this bag, and also to the superfice of the heart.—*Valsalva*, xx. 36.

Case 8.

In March 1706 a woman died of peripneumony in the hospital of St. Mary de Morte. It had been noticed, during the progress of the disease, that there was some inequality of the pulse. This event occurred at a time when Valsalva was gone to Padua, and in his absence I dissected the bodies in the anatomical theatre for him.

Dissection. The lungs were of a compact texture, like that of liver; and the pericardium contained an excessive quantity of serous fluid. The surface of the heart presented an appearance that, at first sight, might be taken for ulceration, but which, in reality, arose from irregular concretions of coagulable lymph. When they were removed, which was readily effected, the external membrane of the heart appeared to be perfectly smooth and uninjured. Concretions likewise adhered to the inner

surface of the pericardium; and though disjoined from those upon the heart, they were evidently of a similar nature.

The gall-bladder contained two black calculi of a rather hard consistence, and approximating to a cubic figure; and though they were unequal in size, neither of them was small.—*Morgagni*, xxi. 2.

Case 9.

A priest nearly thirty years of age, was seized with difficulty of respiration, accompanied with copious expectoration. At the commencement of this affection he complained of pain in the right side of the thorax, and afterwards in the left. He died on the tenth day.

Dissection. There was a small quantity of serum in both cavities of the thorax; and the whole portion of the lungs was covered by a pale coat of lymph. The posterior part of the right lung was extremely florid, and somewhat indurated; and, in the central parts, suppuration had commenced. Slight traces of inflammation were also exhibited in the corresponding portion of the opposite viscus. The pericardium was thickened, and turgid with a yellowish serous fluid. The inner surface of this capsule, and the superfice of the heart, were covered by a reticulated membrane of coagulable lymph.

Valsalva, xx. 20.

Case 10.

Pericardium cartilaginous.

A man about thirty years of age, who dwelt in the midst of a fenny district, was seized with an

affection of the thorax, subsequent to syphilis. He lay in the hospital at Ferrara for a long time, and there his febrile symptoms were removed; but he was not equally fortunate as to the constriction at the chest. This, indeed, gradually became more troublesome, and was associated with tumefaction of the legs, abdomen, and ultimately, of the head; and the fever returned, though it was in a mild degree. He complained of thirst, and experienced augmented difficulty of breathing; he had frequent cough, and constant serous expectoration; and he likewise suffered from pain in the left side, though decumbency on this side was more easy to him than on the right. The œdematous swelling of the head greatly increased, and no small quantity of fluid trickled from the left ear. The power of the heart languished, so that during the two days immediately preceding the man's decease, the pulse was scarcely perceptible.

Dissection. As soon as the integuments and muscles were divided, serum distilled from the cellular tissue. The abdomen contained a redundance of pellucid fluid, of a yellowish colour; and when some of this fluid was placed on the fire and evaporated, the only residue was a pellicle and some striæ. The intestines were inflated and of a pale complexion; but the liver was black.

When the thorax was opened the vena mediastina was accidentally divided, and blood gushed from it with an impetus nearly equal to that which is manifested when a vein is opened in the living body; and the blood was extremely fluid universally. The upper part of the right lung was bound

to the costal pleura by slender filaments, and its posterior surface was inflamed. The corresponding part of the opposite lung had acquired considerable hardness, and was converted, by inflammation, into a sort of fleshy texture. The cavity in which this lung was situated contained a large quantity of sanies, in which there floated substances like jelly.

The pericardium adhered to the heart so uniformly that they appeared to constitute one body. In some places the parietes of this bag were cartilaginous; and in others they were half an inch in thickness. This augmented thickening apparently arose from the fibres having been enlarged, for they presented a somewhat fleshy appearance; and their interstices were occupied by oval bodies, which, on being punctured, emitted a yellowish serum. After this liquid had been squeezed out, they appeared like the folliculi of small vesicles.

Valsalva, xxii. 10.

Case 11.

A brawny youth eighteen years of age, died of pulmonary inflammation at Venice, within eight days from the first seizure.

Dissection. The right lung universally adhered to the circumjacent parts by a kind of thin membrane. Its upper lobule was consolidated; and the remainder of this viscus, as well as the greater part of the opposite lung, was somewhat dense. In the left cavity of the thorax, and also in the pericardium, there was a large quantity of a bloody serous fluid, which had a blackish tinge. In the abdomen there was some accumulation of water;

the edge of the liver was livid; and some parts of the intestines were inflamed, and consequently they exhaled an offensive odour.—*Morgagni*, xxi. 3.

Case 12.

In April 1706, a man upwards of sixty years of age was seized with fever, and likewise with piercing pain in the anterior part of the right side. He lay upon his back, and had a dry tongue, as well as a full and frequent pulse. Having for some days been under the treatment usually adopted in such cases at the hospital of St. Mary de Morte, he appeared to be relieved both from pain and fever, and consequently the physician permitted him to eat the common provisions of the hospital. Soon after he had been allowed this privilege, however, he experienced a relapse, for having eaten freely, after evacuations from purgative medicine, he had a recurrence of pain and fever. His pulse was hard, frequent, full, and vibrating, and continued in this state till within a few hours of death. At a period when his respiration was, indeed, accelerated, but not urgent, when he had voluntarily assumed the sitting posture in bed, and when the circumstances rendered it probable that he would live for some days, he suddenly began to breathe with stertor and died. The body was dissected on the same day.

Dissection. The corpse had a squalid and emaciated appearance. The upper lobule of the right lung was large and indurated, and on being divided it was discovered that the texture resembled that of liver, and also that suppuration had

commenced. There was a quantity of a greenish yellow fluid in the left cavity of the thorax. The pleuræ were adherent by means of slender membranes, in that part connected with the diaphragm; but the costal pleura did not appear to be diseased. The inferior lobule of the lung on this side was in a state similar to that of the upper lobule of the opposite viscus.

The pericardium was distended with fluid, like that just described. The aorta was uniformly dilated, and its coats possessed some traces of incipient ossification.

As soon as the abdomen was opened, that odour which usually exhales from the viscera after enteritis was perceptible; and the small intestines were reddened to a considerable extent. The edge of the liver was of a livid hue, and the pancreas was somewhat firmer in its structure than is natural to that organ.—*Morgagni*, xxi. 17.

Case 13.

A husbandman thirty-five years of age, having fallen from an eminence and bruised his right side, was received into the hospital of St. Mary de Morte. Under suitable management the man had recovered, and his dismissal was contemplated. He began to eat inordinately of bread and viscid aliments, so that he had a severe accession of fever: and soon afterwards his respiration became difficult, but was unattended with pain in the chest. He was bled once or twice, but this and the other measures resorted to, proved nugatory. He lay supine, breathing with stertor; his pulse, which

had been full and vibrating, became exceedingly frequent; and he died about the middle of April, 1706, within eight days after the febrile attack. On the following day I opened the body.

Dissection. The face and neck of the corpse were as livid as they usually are in persons who have been hanged. The lungs universally adhered to the costal pleura. In some places it seemed as if the pulmonary and costal pleuræ were in immediate union with each other; but on more attentive examination it appeared that a concretion, like a thin membrane, was interposed. Nevertheless the union was so firm, that when the lungs were forcibly detached from the parietes of the chest, the pleura followed. The inferior lobe of the left lung was large and heavy, and its texture was consolidated. The pericardium contained a large quantity of a turbid yellowish fluid.

The lower part of the intestinum ilium, to a considerable extent, was of a blackish red colour, and the blood vessels were as turgid as if they had been filled with injection. They exhaled that powerful odour which commonly arises from inflamed intestines. The edge of the liver was livid, but its general structure was of a pale colour; and internally it was variegated like marble. The gall-bladder contained but little bile, and that was not of a natural quality. The spleen was large, whitish, and flabby.—*Morgagni*, xxi. 9.

It is evident, from several of the preceding cases, that a hard pulse and an acute pain are occasionally attendant upon peripneumony as well as pleurisy;

and it is equally true that pleurisy may exist without a severely piercing pain.

Morgagni, xx. 38.

Case 14.

A man about sixty-six years of age, who for a long time had expectorated mucus, was seized, in consequence of exposure to cold, with an acute pain in the left side, accompanied with cough and fever. From the commencement of these symptoms he almost incessantly spat a thick and yellow matter streaked with blood. At length, however, this excretion was suppressed; and he died the seventh day of the disease.

Dissection. The left cavity of the thorax contained a fluid which resembled whey, and the lung on that side was not only very hard, but firmly adhered to the mediastinum, and also to the pleura investing the ribs. The lung on the right side had formed similar attachments, but especially to that part of the pleura which lines the anterior portion of the upper ribs; and the corresponding lobule of this viscus was the seat of a cancerous ulcer.—*Valsalva*, xx. 39.

Case 15.

On the second of March, a man fifty years of age, was seized with acute fever and laborious respiration, accompanied with a pain that extended from the sternum to the middle of the abdominal muscles; and during the efforts of a troublesome cough, he also experienced violent pain at the left mamilla and spurious ribs. He could not lie on either side,

nor did he expectorate any thing. On the fifth day he died.

Dissection. There was a small quantity of a brownish serum in the left thoracic cavity, which escaped when the sternum was reflected. The lung on this side was greatly indurated; it was of a greenish colour, diversified, however, with black spots; and when cut into, a serous and putrid colluvies mixed with blood gushed out of it.

Valsalva, xx. 45.

Case 16.

A man about twenty-six years of age was seized with a piercing pain in the right side of the thorax, and fever as well as cough were concomitant with it. He expectorated but little, and about the eighth day delirium came on; but it was most violent during the night. Notwithstanding a cessation of pain, the difficulty of respiration constantly increased, but he could easily lie upon either side. On the tenth day he died.

Dissection. The whole texture of the pulmonary organs was indurated and their posterior surface had contracted some adhesion to the pleura, and the side of the left lung was also united to that membrane. The lungs and pleura were covered by a soft and reticulated substance, and by this, in many parts, their junction was effected. Both the cavities, but especially the right, contained a large quantity of a fluid like whey. When this fluid was set by, there was no separation of its constituents as in a former instance, but it coagulated by exposure to heat. The pericardium was turgid with serum.—*Valsalva*, xx. 47.

The cessation of pain, in this instance, without any assignable reason, I attribute to the affection of the head. Hippocrates admonished us, and Celsus afterwards repeated the warning, on this subject. Both these distinguished men have said "*quibus causa doloris, neque sensus ejus est, his men-*" *tem laborare.*"—*Morgagni*, 48.

Case 17.

A woman in the sixty-fourth year of her age was seized with pain in the right side of the chest; so that she could not lie upon that side without difficulty, nor could she touch the painful part without heightening the uneasy sensation. She had a dry cough; her respiration was accelerated; her pulse was quick and frequent, though small, and weak. On the seventh day perspiration broke out about the head. Under these symptoms the powers of the body languished, and she died about the ninth day.

Dissection. The right lung appeared exceedingly turgid, and was loosely adherent to the pleura through the medium of a kind of membrane of coagulable lymph. Indeed this adventitious membrane so much resembled the pleura when in a sloughing state, that I was persuaded the appearance might easily occasion deception, as it really did to Riverius in a case of pleurisy. In the present instance, however, the pleura was perfectly healthy; but the posterior part of this lung was inflamed and greatly indurated. No morbid appearances were discovered on the left side except adhesion between the pleuræ. The pericardium was distended with serum.—*Valsalva*, xx. 59.

In the two following cases the pulmonary disease was complicated with organic lesion of the liver; and in the latter of them, with deposition of fluid in the brain, and with disease in the uterus.

Case 18.

A man fifty-six years of age, whose habits of life had been very irregular, had recently undergone considerable fatigue from ringing church bells—an avocation by which he obtained subsistence. For some days he had experienced a slightly pungent pain at the interior and lower part of the sternum. The pain greatly increased, and fever, united with laborious respiration, came on. Twice or three times also he had voided bilious dejections.

He was brought into the hospital, and on the fourth day blood was withdrawn from the arm. There was but little serum in the blood, and the buffy coat on the crassamentum was two digits in thickness. On the fifth day the pulse was full and hard; the night had been spent almost without rest; and respiration was performed with excessive difficulty. The urine was high coloured and a little turbid; the pulse frequent, but equal and not hard. Though respiration was difficult and the pain continued in the same part as at first, the man could lie on either side. The sputum was thick and frothy, and of a variegated yellow colour. The next evening blood was again abstracted; and at the beginning of the seventh day there were slight appearances of amendment: but in the evening the pain was aggravated, the pulse became smaller and

more frequent, respiration was additionally accelerated, and the tongue was dry. Copious perspiration arose on the morning of the eighth day, but the succeeding night he underwent great disquietude, and towards the close of the day he breathed excessively quick: the pulse offered but slight resistance to the finger; the sputum consisted of a yellow matter which was fluid and not frothy; and the urine retained the appearance already mentioned. He died early on the ninth day.

Dissection. Both sides of the thorax contained fluid, and on the right side it was yellow and turbid. The lungs were united with the costal pleura at the upper part of the chest; and in several places on the right side the pleura was somewhat thickened. Portions of adventitious membrane lay upon the surface of the right lung, but the pulmonary pleura itself was not diseased. The lungs were heavy, and their texture was converted into a substance resembling liver—they were hard, but whitish, and less than they usually are when so dense. On the surface of the lung, contiguous to the mediastinum, and on the mediastinum itself, the coat of lymph presented a reticular and somewhat elegant appearance; and was easily removable from the parts on which it was deposited. The pericardium contained a large quantity of fluid similar to that which was found in the right cavity of the thorax. The vessels of the larynx and pharynx were turgid with blood; the face was of a livid redness.

In the left meatus auditorius there was some

half-coagulated blood, but I had no opportunity of examining the head.

The liver was so enlarged as to extend across the abdomen, and to cover the whole upper part of the spleen; and it was closely united to this organ. The border of the liver was livid to a considerable extent; it was not indurated but it was a little paler than usual. Twenty calculi of different sizes, though most of them small, were contained in the gall-bladder. One of them was extremely large, and all of them in colour and texture resembled charcoal. None of them were inflammable; but when applied to the flame they sparkled and sometimes crepitated. The spleen was large and flabby, and of a pale colour. Each of the exterior surfaces of the left portion of the stomach, and indeed the inner membrane also, exhibited ramifying spots of a deep livid colour, which evidently arose from inflammation.—*Morgagni*, xxi. 30.

Case 19.

A woman of middle age had an abortion at three months, in the year 1706. She lost an adequate quantity of blood from the uterus; and, in addition to this, a vein had been opened: but notwithstanding this depletion she was seized with pulmonary inflammation on the eighth or tenth day after the miscarriage. During the early part of this illness she was at home, but afterwards she was brought to the hospital and continued there till death, which occurred on the thirtieth day after the abortion. She constantly lay upon her right side, because she was unable to bear decumbence on the

left side or back. She had pain in the thorax, but its situation was scarcely definable. Besides fever, she was afflicted with difficulty of breathing and dry cough, and the distress was heightened by the supervention of ear-ach. She was repeatedly bled, but all efforts for her recovery were frustrated.

Dissection. There was a little turbid fluid in both cavities of the thorax, but the smaller quantity existed in the right side. The lungs adhered to the pleura almost universally, and when detached a whitish pellicle, of an easily lacerable consistence, followed them. The subjacent membrane of the lungs was healthy; on other occasions, indeed, I have examined the lungs and pleura after being covered with these membraniform concretions, and have found them in a perfectly natural state. The lungs in the present instance were inflamed, especially at the posterior part. They were dense and somewhat hard in texture, and in several places had acquired a blackish hue. The pericardium contained some turbid reddish liquid. There had been a little fluid deposited beneath the pia mater. The pineal gland was equal in size to a small grape, and when cut into, it emitted some turbid fluid and a little yellowish matter, and subsided. The membrana tympani, on each side, was of a dark colour and extremely flaccid, and those of the mastoid cells which were nearest to the membrane were more humid than is natural to them. One of the tympana was occupied by a puriform humour. The adjacent cellular substance belonging to the integuments of the head was distended with a kind of mucous water.

The liver was exceedingly enlarged and had pressed the stomach into the umbilical region; and its texture was indurated and somewhat pallid throughout. In the vesicula fellis the bile was nearly black; and the spleen was enlarged. On examining the uterus we found its parietes were somewhat thickened. To the fimbriæ of one of the fallopian tubes, hydatids were attached, so that the larger orifice appeared to be closed; but when it was squeezed a puriform fluid oozed from the canal. Within one of these tubes, at about the centre, there existed a small body which in shape resembled a grape. It was of a black colour, and appeared to be a coagulum of blood. The surface of each ovarium was unequal, and both these bodies exhibited a black spot, beneath which there was a peculiar cyst filled with a black globule. In the centre of one of these globules a smaller cell of a blackish yellow colour was included. The uterus and its appendages exhaled the odour of a sphacelated part —*Morgagni*, xxi. 24.

The unnatural appearances in the uterus and its appendages probably related to the preceding abortion; and the inability to lie upon the left side, may be attributed to the enlarged liver.—25.

Case 20.

Bronchial vessels dilated: hydatid tubercle on the heart.

A man seventy-four years of age, of low stature, and habituated to frequent the tavern, had been subject, during some years, to repeated attacks of pulmonary inflammation, and he was ultimately

carried off, by an accession of that disease, in the hospital at Padua. There was no person who could accurately detail the peculiar features of his last illness; but I ascertained that he had not any deliquia, palpitation, or inequality of the pulse: nor indeed was there any symptom which indicated disease of the heart.

Dissection. The lungs were universally adherent to the pleura. The upper part of the right lobe was hard and blackish; and the blood vessels of the same lobe were very firmly connected with the bronchia; and one of these vessels to an extent of some digits, was observed to be dilated. The trunk of the bronchial artery, at its origin from the aorta, was three times the usual diameter.

On the posterior surface of the left ventricle of the heart a tubercle existed, which, both in figure and magnitude, corresponded with a moderate-sized cherry. One half of this body projected from the surface of the heart; the other was imbedded within its substance. It bore a strong resemblance to those hydatids which form within the substance of other viscera, as the lungs or kidneys. When pricked it emitted a small quantity of a watery fluid, yet the coats of this body retained a more turbid humour till they were laid open and compressed; and then not only was this humour discharged but also a small membrane containing some white particles like mucus, and others that were of a tendinous firmness. This little membrane appeared to have been a sort of inner coat to the tubercle. The external coat was a dense and white membrane circumvesting the tubercle, and its inner surface was

rough and unequal. The circumjacent fleshy substance was in a natural state. The left auricle was considerably elongated, and numerous bony laminæ were discovered within the coats of the aorta. *—*Morgagni*, xxi. 4.

The dilatation of the vessels, and perhaps also the cohesion of the pleuræ, may be ascribed to the peripneumony. For in consequence of the pulmonary circulation being impeded by repeated attacks of inflammation, the blood-vessels would be exceedingly liable to distension. †

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* The tubercle on the heart seems to have been the remains of an hydatid similar to those with which Morgagni compared it. A case of hydatid in the substance of the heart by Mr. Price, is published in Vol. XI. of the Medico-Chirurgical Transactions. The subject was a boy ten years old, who was vivacious and playful, and had never complained of langour or of any difficulty of respiration; but he died suddenly. A portion of the pericardium adhered to the heart, and this membraneous bag contained about two ounces of a dark-coloured fluid. In the muscular substance of the heart a large hydatid existed.—*Ed.*

† Membraniform concretions, or false membranes as they have been termed, have been frequently mentioned in the preceding cases as a result of inflammation, and the consequences of this deposition are often highly momentous; indeed the preservation of an important organ will frequently depend upon the possibility of counteracting this process. Portal has shown that they have not only been found in persons who died of inflammation, more or less acute, in cases of the exanthemata, and in numerous other diseases, but that they have been often seen where there had been no sensible disease. He describes them as composed of pellicles of different thicknesses, applied against one another, and separable, with more or less facility, by the scalpel or by maceration. They vary in density and smoothness; admit of different degrees of extension; exhibit no trace of vascularity; and have been found of a white, grey, or brown colour. They form upon serous membranes; as the arachnoid, the pia mater, the internal surface of the pericardium,

Peripneumony, with inflammation and other affections of the pleura.

In several of the preceding cases the pleura had been implicated in the disease, but in the following

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the pleura and peritoneum; also upon fibrous membranes, as the dura mater, the periosteum, external membranes of the eye, ear, and capsules of the joints; and upon mucous surfaces, as the membrane of the air tubes, of the alimentary canal, the genital and urinary organs, &c. Some of these concretions wherever found, soften in boiling water; others, however, will harden, from which circumstance Portal inferred that some were gelatinous and others albuminous. He attributed them chiefly to a concretion of coagulable lymph secreted from the membranes; often from being irritated by foreign bodies, or by some acrimony, but most frequently from inflammation. There is not so great a tendency to the effusion of coagulable lymph in the mucous membranes as in the others. It is often thrown out by the latter during slight inflammatory action, though but seldom by the former, except from violent inflammation. It is not only effused upon the surface of membranes, often uniting the contiguous parts by adhesive inflammation, but it is also effused into the substance of the different organs of the body, and particularly into their cellular texture, where it occasions morbid adhesions and obliterates the natural organization of the part. The density and consolidation of the lungs in cases of peripneumony, arise from its being deposited in the parenchymatous structure of these viscera, in combination, perhaps, with some blood extravasated from the injected vessels. In general, wherever lymph is effused, vessels speedily shoot into it, and impart to it the nature of organized substances. In this way many tumours and polypi originate and grow, where circumstances are, in other respects, favourable to these processes. The chemical properties of coagulable lymph are these of albumen; and occasionally there exists so much of it in the serous fluids effused into the cavities, that they not only coagulate by exposure to heat, but, whilst they merely stand at rest, a portion of them congeals.

Valsalva and Morgagni found the blood in a state of fluidity, and also a redundance of serous fluid in the head, in cases which it did not appear requisite to adduce.—*Ed.*

instances the affection of that membrane was more distinct. In some of them there appeared only an increase of vascularity, and consequently of redness; in others the pleura was opaque and thickened; in one, sphacelation had taken place; and in two, the membrane was ossified.

Case 1.

Inflammation of the pleura.

A young man who had previously laboured under chronic fever, was seized with an acute febrile affection, united with pain of the thorax, difficulty of respiration, cough, and occasional expectoration of matter which was tinged with blood. During the earlier period of this attack he generally lay on the left side: and during the latter days of life he constantly preserved that position. He died about the sixteenth day.

Dissection. The magnitude of the spleen was augmented in at least a three-fold degree. The left lung was extremely turgid; it was also universally inflamed and indurated, and adherent to the costal pleura; and this membrane was slightly red. The pericardium was distended by a fluid resembling whey; and there were some concretions scattered on the surface of the heart.

Valsalva, xx. 51.

Enlargement of the spleen is a frequent consequence of protracted febrile diseases. In Hungary this viscus is almost constantly found in a state of infarction after slow fevers, but more particularly as a consequence of quartan ague.—*Morgagni*, 52.

Case 2.

A servant man fifty-five years of age, complained of pain in the middle of his chest. He could only lie upon his back, and for a short time on his left side; but in no position could he respire unless the neck was elevated. He died on the sixth day.

Dissection. The posterior part of the left lung was greatly indurated, and was firmly annexed to the costal pleura. That part of the pleura also which invests the diaphragm was of a red colour. A small quantity of serous fluid was found in the thoracic cavity, and its appearance resembled that of pus. The pericardium contained some turbid fluid.—*Valsalva*, xx. 53.

Case 3.

A man who had long been afflicted with a variety of diseases, which arose, in general, from the abdominal viscera, and whose liver was greatly diseased—was seized, at length, with acute pain in the left division of the thorax, and decumbence on that side was difficult, though he could easily lie upon the contrary side. In the beginning of this accession he had cough, with some expectoration; but about the tenth day he ceased to expectorate, and died.

Dissection. The upper part of the left lung was converted into a hard tumour, which compressed the circumjacent parts. In some places it was connected with the pleura by slender filaments, and this membrane itself was inflamed. The union between the pulmonary and costal pleuræ, on the opposite side, was so firm that they could scarcely

be dissociated without laceration; but in other respects this lung was in a natural state. There was a small quantity of fluid in the pericardium.

Valsalva, xx. 55.

CASE 4.

A soldier of middle age, and somewhat slender, died in the hospital at Padua, about the beginning of March 1743, when I was engaged in demonstrating some parts of anatomy to the students, and the body of this man was brought to me. The account given me of his illness was, that during the earlier days, after being attacked with disease, he complained of a piercing pain in one side, attended with fever, cough, and difficulty of breathing. At length he became somewhat lethargic, and slightly delirious; his fingers trembled, and during the last days of life, his pulse was imperceptible. I predicted to the crowded circle of pupils and learned men, that the lungs were converted into a substance like liver, and that in the head there would be found a redundance of serous humour, and a plenitude of vessels.

Dissection. Both lungs were generally adherent to the costal pleura, except at the anterior part. The right lung was enlarged, heavy, and almost wholly indurated; its surface was smooth, and its texture resembled that of boiled liver. The left was rather harder and somewhat redder than usual. The pleura on the left side was opaque; but on the right side it was almost universally reddened from inflammation. The wind-pipe was very wide, and the bronchial glands at the bifurcation of the trachea were enlarged. There was no effusion

of serum into the cavity of the thorax, but when the lungs were severed from the wind-pipe, a considerable quantity of bloody and frothy serum issued from the right viscus, and a small quantity from the left. The pericardium contained a redundance of yellow serum slightly tinged with blood.

As soon as the cranium was sawn into, a watery liquid flowed out of its cavity. The vessels which ramify through the pia mater were turgid with blood; and bloody points, greatly multiplied in number, were dispersed through the medullary substance. The lateral ventricles contained a large quantity of turbid serum, the choroid plexuses were vesiculated, and some of the vesicles were of a rather large size. The fornix and medulla oblongata were of a soft texture.

The omentum adhered to the caput coli, and when it was detached the intestine was observed to pursue a preternatural course: for having risen to the liver, it immediately descended below the umbilical region, whence it re-ascended obliquely to the left hypochondrium. The whole of the colon was considerably inflated with gas. The pancreas was indurated; the spleen and liver were enlarged; the latter viscus was also of an unnaturally pallid hue; and the ductus communis was dilated.—*Morgagni*, xxi. 33.

Case 5.

Peripneumony and pleurisy, with enlargement of the heart.

The body of a man was brought to me for dissection before the end of March 1744. He had

obtained his livelihood by sifting wheat, an employment which is always pernicious to the lungs. He had recovered from an attack of pleurisy, but, unfortunately, had a relapse, and died on the eleventh day. The symptoms under which he laboured were, an obtuse pain in the thorax, particularly on the right side, as well as frequent cough with but little expectoration; and the sputum which he did eject was viscid and bloody. His face was florid, his pulse was hard, greatly confused, unequal, and intermittent; he was not wholly exempt from convulsive tremors, and was unable to respire except when sitting up. The blood, which was repeatedly withdrawn, had a thick buffy coat on its surface. There was intumescence of the abdomen, and the feet and legs were œdematous.

Dissection. As soon as the cartilages of the ribs were divided, serum issued from the thorax. There was a large quantity of this fluid in both cavities, but especially in the right; and concretions floated in it like the dregs of wine. No adhesion had been contracted with the costal pleura, but, on both sides, this membrane was redder than it is in the healthy state: this increased vascularity, however, was greatest on the left side. The inferior lobe of the right lung was hard and turgid, and when incised it was discovered to be unusually dense in its structure, and of a brownish purple colour. There was an excess of fluid in the pericardium, and the heart was enlarged, in consequence of dilatation of the ventricles, more particularly of the right; but the parietes of these cavities were not thickened.

The morbid appearances in the abdomen were a copious effusion of serum, and an indurated liver, the internal structure of which was variegated with numerous white particles.

Other instances are recorded, in which the cavities of the heart have been dilated under similar circumstances; and we cannot be surprised that this should happen when the transmission of blood through the lungs is obstructed by inflammation; and though this will chiefly affect the right cavities of the heart, its influence will extend to the opposite side of this organ. Senac relates that he had often met with dilatation of the heart, especially on the right side, after inflammatory affections of this nature.—*Morgagni*, xxi. 34.

Case 6.

Sphacelation of the pleura.

A young man twenty-five years of age, of a pallid complexion, and who had antecedently laboured under strumous and venereal affections, was seized with shivering and fever in January 1706, after being greatly heated by violent exertion. In connexion with those febrile symptoms he felt an acute pain throughout the chest, but particularly at the lower part. He likewise suffered pain in the back, and indeed through the whole circumference of the body; and the pain was aggravated by pressure. He could only lie upon his back, on account of the difficulty of respiration. The pulse was frequent and small, and the sputum was fluid and tinged with blood. He complained of an internal sensation of heat, and on

the fourth day he voided some bilious dejections. On the eighth day, after very copious urinary excretion, this disease terminated in death.

Dissection. The right cavity of the thorax contained a serous fluid, which was turbid and sanious. Both lungs adhered to the diaphragm, as well as almost universally to the other parietes of the chest. The anterior part of the left lung was united to the pleura merely by filaments; but the adhesion in other parts was effected by the interposition of an adventitious membrane, of a white colour, and of a tenacious quality: and in some places, on the right side, it was scarcely less than half the thickness of the ring finger; but on the left it was materially thinner. When this concretion was separated from the lungs, which was readily done, the coats of those viscera presented a healthy aspect: but the costal pleura on the right side was somewhat opaque; and that part of it which covers the triangularis muscle of the thorax, was in a state of sphacelation, and lacerable by the slightest touch of the finger. The contiguous muscle, and the adjacent fleshy portion of the diaphragm on each side, extending to the centre of this septum, in those parts to which the lungs had been adherent, presented traces of inflammatory lesion. The left lung contained a portion of calcarious matter, and in other parts the texture of this viscus was indurated, dense, and heavy; but in all these respects the opposite lung had undergone a much greater degree of disorganization. The pericardium contained a little more fluid than is usually found in this bag.

The stomach and intestines, but particularly the colon, were inflated with gas. The lower part of the spleen was peculiarly black, and this appearance entered deeply into its substance, so as to indicate the commencement of gangrene. The liver was greatly enlarged, and had a pale complexion. The gall-bladder contained upwards of seventy calculi and a little bile of a light yellow colour. The larger calculi did not exceed a bean in magnitude, and there were only a few of this size: the smallest, however, was not less than a peppercorn. The former were nearly oval;—the latter approximated to the cubical form. They were constituted of an inner portion, which was moist with bile, and granular; and this was enclosed in, at least, a double incrustation, which in most of them was of a greenish hue, but in some it was partially white. All these concretions were inflammable. The right kidney was exceedingly flabby.—*Morgagni*, xxi. 36.

I never witnessed a greater degree of pleuritic lesion consequent upon thoracic inflammation than was exhibited in this instance. Though ancient authors have entertained differences of opinion with respect to the complication of pulmonary with pleuritic inflammation, it cannot be denied that sometimes essential morbid changes take place in the costal pleura without injury of the lungs; but undoubtedly such instances are exceedingly rare, in comparison with the multitude of cases in which membraneous inflammation is combined with the parenchymatous. Indeed, in dissection, inflammation of the pleura is not so

often found after thoracic inflammation as some have supposed. Haller asserted that it never appeared to him that inflammation of the pleura alone had been destructive to life.*

In the following instance, however, by contrasting the degree of lesion of the pleura with that of the lungs, it may be inferred that the man's death should chiefly be attributed to inflammation of the membrane; and I do not recollect to have met with a parallel instance in the histories of Valsalva, or amongst those which have fallen more immediately beneath my own observation.

Morgagni, xxi. 37.

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* At the close of the twentieth and twenty-first epistles, Morgagni has filled several long articles with an examination of conflicting testimonies respecting the frequency of inflammation in that portion of the pleura which invests the ribs, independent of inflammation in the substance of the lungs. We may summarily state, that, in numerous cases in which there had existed the symptoms usually recognised as diagnostic of pleuritis, the inflammation was seated in the substance or coats of the lungs; and when it might have originated in the costal pleura, the viscera were usually, though not uniformly, implicated in the disease. Morgagni, it will also be observed, had found the pleura inflamed when there had been no very acute symptoms.

Portal entertained the opinion that there was no essential difference between pleurisy and peripneumony. He endeavours to show, as the result of his dissections, that the pulse, which is said to be hard in pleurisy and soft in peripneumony, and that the heavy pain and oppressed respiration of the latter, as well as the acute pain of the former, are all extremely uncertain. He suggests the probability that the pain of the side may sometimes arise from sympathy between the nerves of the lungs and the intercostal nerves.—*Ed.*

Case 7.

A man about fifty years of age, whose thigh had been for many years the seat of a leprous affection, was attacked with quinsy, which continued for two days, and terminated in a pain of the back, to which were added dry cough, urgent thirst, inability to lie upon the right side, and an oppressive constriction at the lower part of the thorax. Although the febrile symptoms were mild during the latter days of the disease, and though there were no indications of thoracic inflammation besides those which have been premised, yet the patient died on the ninth day from the period of decumbiture.

Dissection. The left cavity of the thorax was full of a puriform serum; and, in consequence of concretion having taken place, a kind of membraneous expansion adhered to the pleura, and presented the appearance of ulceration in that membrane. When this stratum of lymph was removed, the pleura was found to be inflamed, and the lungs themselves had sustained a slight degree of similar lesion.*—*Valsalva*, xx. 56.

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* The puriform appearance of the serous deposition into the thorax, reminds me of a case, which was peculiarly interesting to myself in consequence of its having occurred in the person of an intimate friend. I considered it a case of rheumatic inflammation of the diaphragm and pericardium, complicated with erythema of the mucous coat of the intestines, but unattended by the usual symptoms. So much did the fluid in one part of the thorax resemble pus, that, at the time, I believed it to be really of that nature, but subsequent cases and reflection have convinced me that it was puriform, rather than purulent; and I apprehend the peculiarity of appearance arose from the quantity of coagulable

Case 8.

Thickening of the pleura.

A servant maid nineteen years of age, of a plethoric habit, and who for three months had

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lymph which had been effused, and the manner in which it was combined with the serous fluid.

In the night of March 7th, 1820, I was called a few miles into the country to see Mr. Bates, a gentleman about 36 years of age, whom I found exceedingly ill, and was informed that on entering the coach to return home from London the preceding day, he was seized with rigors, on which intense heat supervened. His pulse was extremely rapid and firm, and his mind had been a little confused; but he was perfectly rational when I saw him. He complained of violent pain at the chest, and aching of his limbs: his countenance and general appearance bespoke a most formidable attack of disease. I bled him copiously, administered a free dose of hydrargyri submurias, and prescribed a periodical dose of a saline purgative.

On the following morning I found his situation greatly ameliorated, but his pulse was rather quick; and he had some erratic pains in the limbs and joints. He had no rigors, and the bowels had been plentifully opened. The general directions were to live abstemiously, and to keep the bowels in gentle action by the aperient medicine. On the third day from the attack he felt nearly well. I found him down stairs; he had been walking out a little, and informed me that he purposed to be in town for an hour on the morrow.

Though I could not but be highly gratified with my friend's rapid and decisive amendment, yet the severity of the onset, and the commotion through the whole system which immediately resulted, left upon me a deep impression that though the storm was hushed, the subject assailed was still in jeopardy. Many cautions were given, but as he thought his recovery complete, and as urgent business demanded his presence, I agreed to wait his arrival in town for our next interview. Perfect, however, as was this intermission, it proved to be only the prelude to a more painful and ultimately fatal attack. On the evening of the same

menstruated less freely than usual, was attacked with a piercing pain in the thorax, and difficulty of

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day febrile symptoms recurred, accompanied with some wandering pains: he passed a distressing night, and early the following morning my attendance was requested. He complained of almost intolerable pain in the loins, extending thence to the thorax, and especially through the region of the diaphragm, but rather on the right side. His respiration appeared to be carried on without the action of this septum. He had not evacuated the bowels for twenty-four hours; consequently there was some abdominal intumescence, but no tenderness. He experienced a sense of violent constriction at the chest; the pulse was a hundred and twenty; and the tongue yellowish. I took from him twenty ounces of blood, and instituted, both in relation to diet and medicine, a strictly antiphlogistic plan.

In the evening Dr. Uwins was associated with me in attendance, and he most strenuously exerted both his skill and kindness to avert the catastrophe which awaited the patient. We had the satisfaction to find the violence of the symptoms a little abated: the celerity of the pulse had diminished, and the acuteness of pain was blunted, but there had been no alvine excretion. We agreed to repeat the bleeding, and to persevere with purgations, aided by enemata. The ensuing morning we were informed that the pain continued to abate, but the tongue was flocculent and very dark coloured: the abdomen was tumid, and communicated to the patient the sensation of extreme fulness. He could scarcely respire; his countenance was deeply distressed; the angles of the mouth were depressed; and the pulse was a hundred and twenty. None of the means resorted to having proved effectual to open the bowels, we agreed to administer elaterium. He took, in divided doses, three quarters of a grain of Dr. Clutterbuck's preparation of that medicine. A few hours subsequent to taking the first dose, some extremely dark and offensive stools were voided; and between this time and our visit the following day, the bowels had been evacuated copiously: the evacuations were dark and bilious, the tongue was brown, the pulse was very small and weak, the eyes were sunk, and the countenance evinced that peculiar expression of deep solicitude so characteristic of serious

respiration, in consequence of exposure to cold during the menstrual period. The pain was fixed

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organic mischief. He had hitherto subsisted on the most innutritious fluids, and still only partook of liquid aliment.

In the middle of the day the evacuations were rather bloody, and exhaled a cadaverous odour. Though he was evidently in an almost hopeless state, his mind, naturally energetic, was buoyed up from an impression that he had experienced essential benefit since the intestinal evacuations.

On the fourth day after the relapse, (March 13), he reported himself conscious of increased weakness, but he had less pain, and could make a deep inspiration, and fully expand the chest without the least impediment. All the uneasiness experienced in this effort arose from some tenderness of the abdomen. He believed himself to be perfectly relieved from the thoracic affection,—and anticipated early restoration to health.

At this time I felt persuaded that so much organic lesion had taken place that his recovery was utterly impossible; and as he was at the head of a large and interesting family, and was connected with an extensive and precarious mercantile concern, it was deemed expedient to acquaint him with the circumstances in which he really stood; and I only advert to this topic inasmuch as it elucidates the state of his bodily feelings. He was a man who had lived in habitual thoughtfulness of death and preparation for a future world; consequently though surprised when I candidly informed him of the importance of arranging his affairs, on account of his perilous situation, he was not alarmed, but received the communication with grateful fortitude, and immediately prepared to make the necessary adjustment. Although the interview with his parents, his wife, his children, and domestics, had been of the most affectionate character, I found his mind perfectly tranquil in the evening. The evacuations from the bowels were of a better colour, and still frequent. He felt so comparatively well, however, as almost to question the truth of the prognostic as to the fatal issue; nevertheless whilst we were assiduously employing every means which offered the least prospect of benefit, he waited the result with tranquillity.

On the 14th of March it was evident that the period of

below the left mamma, and was aggravated by pressure, so that she was unable to lie on that side.

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dissolution was approaching, but it was preceded by an accession of disease in the region of the heart. His extremities were cold, and his pulse imperceptible; but his intellects were unclouded: and when interrogated on points relating to the disease, he said with energy, "I feel just as I ought to feel after a constipated state of bowels—comfortable but weak."

The pain which resulted from the attack upon the heart increased progressively through the day, and in the evening it was almost beyond endurance; but it was somewhat mitigated by an opiate. He died on the 15th, at eight o'clock A. M.—eight days from the primary invasion, and six from the recurrence of disease.

During the whole illness he had no cough nor any lividness of countenance. The dulness of pain in the abdomen, and, finally, the diarrhœa, denoted erythema of the mucous coat of the intestines, in contradistinction to the very acute pain, and the constipation, which usually arise from the adhesive inflammation of the peritoneal.

Dissection. The external aspect of all the abdominal viscera I found perfectly natural, but the intestines, especially the colon, were inflated with gas. The mucous coat of the stomach was extremely red and appeared as if blood-shot; and this appearance extended through the duodenum: it became more slight in the other small intestines, but was again considerable in the cæcum. The villi were exceedingly turgid with blood. In the colon there was a remarkable cohesiveness of the fæcal contents to the mucous surface, which I found to arise from their adhesion to that kind of extraneous membrane so often formed upon inflamed surfaces, and which pervaded nearly the whole of this intestine.

On attempting to open the thorax I found the cartilages had ossified, and in some places the intervening ligaments were almost in the same state—circumstances unusual at so early a period of life. As soon as the thorax was penetrated by dividing the fourth rib, serum and lymph began to issue; and when the sternum was reflected, I found the pleura pulmonalis on the right side strongly adherent, in several parts, to the costal pleura, and to the diaphragm. At the upper part of the chest, between the adhesions,

After having been bled she was brought into the hospital of St. Mary de Morte at Bologna. She lay upon her back; and her pulse was quick and small, and but slightly resisted the pressure of the finger. Respiration was attended with a sound in the trachea like ebullition; she had a dry sonorous cough, and her tongue was parched, but the bowels were moderately open. At intervals she betrayed a slight degree of delirium. Blood, which had been drawn from the arm six hours before, exhibited a small quantity of serum of a golden colour, and somewhat turbid; and there was a yellow crust,

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about a pint and half of serum containing numerous flakes of coagulable lymph, was deposited: and below that fluid, nearly an equal quantity of pus, or, at least, a puriform fluid, was accumulated. This fluid was separated from the serous by parietes of coagulable lymph in the form of a dense but ragged cyst, resting upon the diaphragm, the pulmonary surface of which was highly inflamed throughout.

The pericardium was occupied by about a pint of turbid fluid, like whey; the superfice of the heart was coated with lymph; and the inner surface of the pericardium was highly inflamed and likewise covered with this kind of concretion. The heart itself was small and empty; and the parenchymatous tissue of the lungs did not appear to be involved in the disease.

It appeared that this was an instance of inflammation affecting the pleura which invests the right cavity of the chest, especially its lower part; and also the pleuritic covering of the diaphragm, and of the heart and the pericardium; and it is remarkable that such extensive disease should exist in these organs with so little impediment to the function of respiration. The extensive effusion of lymph on the mucous surface of the intestines, indicates that a high degree of inflammatory action had existed in that canal. Although this evidently arose spontaneously, it is possible that the means which it appeared necessary to employ, had tended to heighten it without counteracting the morbid process in other parts.—*Ed.*

like rancid fat, upon the crassamentum, two digits in thickness. The symptoms progressively increased in severity, and on the seventh day the disease terminated fatally. This event, however, was preceded by the discharge of a humour from the mouth like frothy water tinged with blood. I examined the body on the following day, namely, the eighteenth of March 1706.

Dissection. The lungs adhered to the diaphragm, and, indeed, to all the parietes of the thorax. In some places this adhesion was effected by the intervension of membranes, but in most parts, especially at the sides and back, the pleuræ were in immediate union; and in those places the costal pleura was somewhat thickened, and easily divisible into two laminæ. The upper lobe of the left lung was indurated, and of an hepatic compactness of texture, and of a pale colour. The remaining lobes of the lungs retained their natural structure; but they were distended with a frothy mucus; and indeed from some of the ramifications of the bronchia, a white matter issued, when these air-tubes were divided—matter that was in every respect like pus. In the trachea, and larger trunks of the bronchia, there appeared some greyish concretions, and some of the same concreted substance remained on the tongue. From the orifices of the mucous glands, situated at the posterior part of these tubes, I squeezed out a whitish and somewhat thick matter; and some of the larger glands, at the bifurcation at the trachea, were not in a healthy state. A considerable quantity of coagulable lymph was thrown out between the lobuli of the lungs. The

pericardium was plentifully laden with a reddish fluid.

A degree of inflammation had existed in some of the abdominal and pelvic viscera; and the spleen was impregnated with a gangrenous blackness. These organs exhaled a most offensive odour.

As soon as the cranium was opened, an acid smell, like the halitus of children who have worms, was perceived. The vessels of the dura mater were turgid, and there was fluid between that membrane and the pia mater. The cerebrum was a little softer than natural, and the cerebellum was much more so.*—*Morgagni*, xxi. 29.

Case 9.

Thickening of the pleura, and ossification of the falx.

In March 1745 I dissected the body of a middle-aged man, who had been a stone-cutter. The assistant physician of the hospital being present, we learned from him that the man was attacked, in the first place, with fever, and soon afterwards with acute pain in the right side; and we also ascertained that diarrhœa then came on, so that he had eight

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* Morgagni has not given a precise statement of the degree of thickening which the pleura costalis had undergone. This sometimes consists of little more than opacity, but at other times it is perceptibly thicker to the touch as well as to the eye. It may not only be thickened by enlargement of vessels and deposition within its texture, but by accretion of coagulable lymph and its subsequent organization. I possess a specimen, taken from a phthisical subject, in which the pleura was half an inch in thickness, and seemed to consist of a dense cellular tissue, but distinctly vascular. Other cases in which this membrane was thickened have been related.—*Ed.*

loose, but not yellow evacuations in twenty-four hours ; and not long after this period an oppressive pain arose in the thorax. He was not brought into the hospital till the fifth day, for among the common people there prevails a disposition to delay an application till disease has made considerable progress. The blood withdrawn was dense, but exhibited no buffy coat. An expectoration of bloody mucus commenced, but its duration was short. At length the intellects became perverted, and the pulse, which before had been tense, gradually languished, and on the eleventh day the patient died.

Dissection. Close adhesion existed between the pleuræ at the posterior part of both lungs, and also at the whole of the lateral surface on the left side. Wherever the lungs had adhered to the parietes of the chest, the costal pleura was unequal. Towards the back, this membrane was of a blackish colour, and, on the left side, it had not only lost its natural complexion but was thickened. The diaphragm likewise, both in the tendinous and fleshy parts, to which the lungs had been annexed, was of a brownish red colour, and its blood-vessels were unusually distinct. The lungs were dense at their posterior and lower parts, and not only was the surface black, but the indurated substance was deeply penetrated with the same appearance: an extensive portion, on the left side, was the most hardened and compact. On the anterior part, particularly on the right side, a soft and uncommon substance was found, which, when cut into, exhibited a rosy hue. The pericardium contained a little more serum than is usually found in that bag;

and the vessels on the surface of the heart, as well as the venæ cavæ and right auricle, were replete with blood.

Some portions of the intestines were inflamed. The surface and substance of the liver were pallid; the gall-bladder contained a very few drops of bile, which, when spread upon paper, imparted to it a yellowish brown tinge. The spleen was enlarged and flabby.

Upon one surface of the falx a small bone was formed, which, though smooth, was of an irregular figure, and not very thin; and its size was quite equal to that of the little-finger nail. Within the sulci of the cerebrum, beneath the pia mater, a secretion resembling jelly reposed, and the blood-vessels of this membrane were in a turgid state.*

Morgagni, xxi. 35.

Case 10.

Tuberculated pleura.

A woman forty-five years of age, having an inveterate ulcer in the leg, and slow fever, came into the hospital of Incurables at Bologna, in the autumn of 1705. During the first three days she drank excessively of wine, with which she had supplied herself before coming to the hospital; and consequently she was greatly heated, and her pulse became frequent, hard, and tense. An acute pain also commenced at the lowest true rib on the left side, and decumbency was most easy on the right side: but when she attempted to lie upon the

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* See a case of ossification of the falx, p. 7.

painful side cough was excited. The pain afterwards ceased, and of this she had no recurrence: and the pulse, though retaining other morbid qualities, became less frequent. On the fourth day she was attacked with shivering succeeded by heat, and was considerably worse. Her cough had hitherto been dry, but she now expectorated fetid and bloody pus, of a dark colour. She could only respire when the neck was elevated. The pulse became smaller and more languid, and the pus of a livid hue. Slight delirium also came on; and during the latter days of life the quotidian accession of fever was later than it had been. In the middle of the sixth day she died, apparently from sudden suffocation.

Dissection. Each cavity of the thorax contained a small quantity of an ash-coloured and offensive serum, and the lungs adhered slightly and loosely to the costal pleura. This membrane, in some places on the left side, where the lung had been adherent, was rough and unequal, from bodies which appeared like small and red tubercles.* At the lower part of the lung, on this side, there was a concretion of lymph in the form of a double membrane, one portion adhering to the lung, the other

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* The substances mentioned in this case may have been granulated portions of lymph, which, we may infer from their colour, had become organized. At the same time it is unquestionable that the pleura has been the seat of tubercular affections from other causes. Steatomatous tumours, and hydatids have also existed in this membrane. The tubercular accretions of serous membranes will be more particularly considered under diseases of the peritoneum, and hydatids. *Ed.*

to the diaphragm. This lung was of a livid colour, and even firmer than liver. When cut into it was found to contain pus like that which had been expectorated; but in some of the sinuses that morbid secretion was of a yellow colour.

The abdominal viscera were in a natural state, and the head was not opened.—*Morgagni*, xxi. 32.

Case 11.

Ossification of the pleura; hydrocele.

A butcher, seventy-eight years of age, of a tall stature and pale brown complexion, who had been affected with hæmoptysis, began to feel an internal and piercing pain a little below the left mamilla, four days antecedent to his admission into the hospital. His pulse was not only unequal, but often quick and intermittent, and offered but little resistance to the finger. He had frequent cough, accompanied with a sound which almost resembled the barking of a dog. The sputum was thick, and contained particles of a white substance, like concretions of lymph. Respiration was difficult, and he could only lie upon his back. He was bled on the day of admission into the hospital, and the blood was found to contain so small a quantity of serum, that only one table spoonful separated from eight ounces, and that was turbid. The blood exhibited a buff and cupped surface, and this buffy coat was two inches thick, and very tough; and the subjacent crassamentum was divided into a number of distinct clots. The expectorated matter became bloody. As there was no remission of disease, on the seventh day blood was again withdrawn; its

crust was thin, and the serum was in due proportion, but of a golden colour, and the crassamentum was of a natural firmness. The expectoration diminished, whilst the other symptoms continued. The patient became unable to speak, and died on the eighth day.

Dissection. The right lung adhered almost universally to the pleura, but was separable with facility, and without injury to the membrane, except at the higher part of the upper lobe, where the adhesion was firm; and within the substance of this lobe, which was of a livid hue, there existed numerous small round cells, each surrounded by its proper follicle. They were smooth internally, and empty, and I supposed them to be the vestige of an old disease. The odour of this part of the lungs resembled that of acid whey, or the halitus of children having worms. The upper lobe of the left lung abounded with a serous humidity, and the inferior lobe was heavy, red, and of a liver-like texture. It had contracted adhesions with the pleura, and, in some places, was covered with broad portions of coagulable lymph; and a similar concretion, having a red colour, was spread upon the corresponding surface of the diaphragm.

The pleura that invested the ribs, and covered the diaphragm, was not merely of a cartilaginous or bony hardness, although that is a rare occurrence, but it in fact consisted of large and not very thin bony laminæ; and from its thoracic superfice numerous osseous tubercles projected, but more particularly at those points where the laminæ

existed. They were hemispherical, and of the size of vetches. Although these appearances were less numerous within the right cavity, nevertheless the above description was applicable to many parts of the pleura on that side. The membrane did not exhibit the least appearance of heightened vascularity on either side. The pericardium contained a small quantity of a somewhat bloody fluid.

The inguinal glands were enlarged; and there existed a hernia in the right groin; and fluid in the tunica vaginalis testis. I suspected this fluid arose from a ruptured hydatid, in consequence of observing a small and almost solid and flesh-coloured body, attached, by a peduncle, to the tunica albuginea, where it surrounds the belly of the testicle. This tubercle appeared to be the residue of a vesicle, and seemed to be constituted of its contracted and thickened parietes.

Morgagni, xxi. 19.

The concretions said to have been expectorated might be similar to those which sometimes form in the uterus and in the intestines. I have seen them bearing the form of the trachea, which they exhibited when floated in water. Ruysch and Cheselden have represented ramified concretions of this nature; they have been seen by other anatomists, and when hollow were supposed to be veins.—19.

Haller found the pleura callous, but never ossified; and Hottinger observed it converted into a texture not unlike cartilage, a change which he conjectured to have arisen from pleurisy, under which the woman had laboured some years before. Perhaps the cases of Haller, and that of the old

man of whom I have spoken, originated from preceding inflammation.—22.

Case 12.

Ossification of the pleura.

A man about forty years of age was seized with pungent pain in the right side, accompanied with fever and an exceedingly hot skin. He had been bled at home, and was brought into the hospital on the fourth day. His pulse was small, frequent, and somewhat unequal; and his respiration accelerated and languid: he lay supine, his countenance was sleepy, and his mind somewhat confused. He passed the night with considerable inquietude, and difficulty of breathing; and the respiratory function became increasingly difficult, so that on the following morning he breathed with stertor, and died about the end of the day.

Dissection. There was no morbid appearance in the pleura, except that near the left side of the spine the membrane was rough, from the existence of three or four white tubercles as hard as bone; and within the same cavity the lung was loaded with a considerable quantity of a yellow mucus. The right lung was large and heavy; its texture was like that of liver; and in some places it appeared as if verging to a state of suppuration.

The vessels of the pia mater were turgid; and a moderate accumulation of serum was found beneath it, and also within the lateral ventricles.

Some parts of the small intestines were slightly inflamed. The texture of the liver was rather hard; and its edges, and a considerable extent of

its surface were livid. The spleen was so flabby, that its tissue could easily be broken down with the finger.—*Morgagni*, xxi. 23.

Symptoms of peripneumony and pleurisy from derangement in the organs of digestion.

Case 1.

A young man had the symptoms of acute pleuritis. He had piercing pain in the right side, and inability to lie upon it, with intermittent fever. On the ninth day he brought up a fetid coagulum of blood, which I believe came from the stomach. It was the size of a chestnut, and all the symptoms disappeared immediately on its being ejected.

Morgagni, xxi. 43.

Case 2.

Another young man laboured under the usual indications of pleurisy, associated with nausea. The symptoms were aggravated by the treatment which generally is beneficial in pleuritis. At length he vomited a lumbricus teres, with some blood; and was immediately relieved from the affections which have been adverted to.

Though I was not ignorant that many similar instances are extant, I related these cases to the Academy of Sciences at Bologna. In fact the members of the academy were at that time engaged in a discussion on the subject of pleurisy, in consequence of letters transmitted to me by a late experienced physician of Cremona, Ignatius Pedratti, in which letters he described, with much precision, several cases of pleurisy from worms. The affection

had prevailed at Farnese, (where he then practised), and in its vicinity, in the winter of 1705.

Morgagni, xxi. 43.

In these cases, though originating from worms in the abdominal viscera, actual disease had supervened in the thorax. I shall subjoin what Pedratti observed in the cases to which his communication referred.

The first symptom was a rather obtuse pain in the side, which, at the commencement, was moderate in degree, and occasionally was intermittent. There arose symptoms of abdominal worms, and ordinarily some were ejected from the mouth as well as others voided *per anum*. There was violent cough and expectoration of a white and unmaturated sputum streaked with blood. The fever was of a continued form. The pulse was not hard and tense as it usually is in pleuritis, but was small, soft, and unequal. From the commencement, to about the fifth or seventh day, the disease appeared to be nearly stationary, or indeed progressively to decrease. Afterwards, however, all the symptoms recurred with redoubled violence, combined with greatly impeded respiration, and diminution of strength, so that for eight and forty hours there was extreme disquietude, and a sense of internal heat whilst the exterior parts of the body were cold. When there was a cadaverous lividness of the skin, death was inevitable, and the patients were usually carried off at about the expiration of that period which has just been mentioned.

Dissection. Many bodies were inspected both at Farnese and the adjacent villages. The abdominal

viscera had sustained various lesions of structure. Sometimes they were scirrhous; at other times they were found obstructed, or in some different morbid state; and the stomach suffered more than the other viscera. This organ was inflated, and loaded with putrid and offensive saburræ.—44.

The state of the thorax in the most extreme cases, may be elucidated by a reference to the appearance of the lungs in a man who speedily died from a violent attack of this nature. Those viscera were found so tumified that they completely filled the cavities of the thorax; and the lung on the side which had been painful, was inflamed, blackish, and stuffed with a white ichor like an abscess. The pleura was inflamed and livid, but diversified with some bloody points. The intercostal muscles having been highly inflamed, presented the appearance of a bruised part.—45.

From these circumstances, and others noticed by authors who have written on this subject, it appears that the genuine indications of pleurisy have arisen from worms, not only when inflammation in the pleura had really been induced by that cause, but also when there was only a simulation of inflammatory action. It is, therefore, incumbent on physicians to be careful, especially in children, and others liable to worms, lest they mistake for the true disease, that which is sympathetic, and which, when arising from worms, will only yield to anthelmintic treatment.*—46.

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* That the respiratory functions should often be disturbed from abdominal disease cannot excite much surprise, when the association of their respective viscera is considered, as well as the

Pulmonary Congestion.

There is a state of the pulmonary organs in which the vessels of the lungs are loaded with blood, but which should be distinguished from inflammation. In the first case it arose from contraction in the aorta; in the second it is said to have existed in combination with inflammation.—*Ed.*

Case 1.

A damsel, who for some time had menstruated but sparingly, though it took place at the natural periods, was distressed with difficulty of respiration, and at length she died under the symptoms of suffocation.

Dissection. A soft tumour was found in the parietes of the uterus. When the thorax was opened, the coats of the aorta at its origin were found to be so thickened that the caliber of the

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impediment which is presented to the descent of the diaphragm, and to the action of the abdominal muscles, when any essential organic mischief has occurred within the abdomen. In a case of ulceration of the mucous coat of the colon, and great inflation of this intestine, it was interesting to observe the quiescence of the abdomen during respiration. This function, indeed, appeared to be exclusively carried on by the agency of the intercostal muscles; and as the patient, for some time, was more conscious of pulmonary oppression than of any abdominal disorder, he referred to the lungs as the seat of his malady. The case will be related in a note to intestinal diseases.

Sympathetic affections of the lungs are not only derived from the source to which I have just adverted, and also from injuries of the head; but they are liable to originate from local irritation in any other part of the body. Peripneumony is by no means an unfrequent consequence of wounds and of surgical operations.—*Ed.*

vessel was greatly diminished. There was a considerable quantity of blood in this artery, but the superfluity was much more excessive in the lungs, which indeed were quite surcharged with it.

Morgagni, xix. 51.

It must be evident that as the blood could not circulate through the aorta with its natural freedom, it would accumulate in the lungs; from which circumstance difficulty of respiration, and, ultimately, suffocation occurred.—52.

Case 2.

A young man nearly thirty years of age, after protracted exertions, was seized with slight and obtuse pain in the left side of the chest, accompanied with fever, and difficulty of breathing, but he had no expectoration. On the fourteenth day the disease appeared to subside; but suddenly the man experienced a more urgent accession of oppressed and stertorous breathing; and he expectorated, without cough or difficulty, a frothy mucus which had a rosy tint. He died three days afterwards.

Dissection. There was no adhesion between the pleuræ. The whole of the left lung was inflamed except at the upper part, but from this portion, though it was sound in texture, the blood burst forth in two places, so that there was a stillicidium of upwards of four pounds into the left cavity.

Valsalva, xx. 17.

The sanguineous effusion into the left cavity of the thorax, after death, shows the fluidity of the blood. It seemed that a greater quantity of it had been determined to the upper lobe in proportion

as less was transmitted through the lower in consequence of its being obstructed by inflammation. Some of the more minute vessels had ruptured into the air-cells, and imparted the rosy hue to the expectorated matter.*—*Morgagni*, xx. 18.

It cannot be doubted that whatever compresses the cells of the lungs, or renders them unyielding, must be injurious to respiration. Now these cells are too much compressed whenever blood distends the vessels distributed around them, and this effect may be produced by its superabundance, as happens to plethoric persons, in whom dyspnœa is particularly observable when they walk faster than their usual pace, and thus accelerate the circulation. The blood may produce this effect, also, from its being rarified, as in ardent fevers; or the same consequence may arise from any cause of obstruction

* Though it is stated that inflammation occupied one portion of the left lung, I suspect that the inference was drawn merely from vascular plenitude. Whether this was really the case or not cannot be determined; but I believe that congestion often exists without being attended by inflammatory action. Probably they were cases of this nature to which Orfila alluded when he said that there were cases of chronic and even of acute pneumonia, without either cough, or expectoration, or fever, when the patients do not even complain of breathing with any great degree of difficulty. The diagnosis in such cases, he says, "can only be established with certainty by the concurrence of the two following signs: first, the impossibility of making deep inspirations; and secondly, the pain of the breast." Singly he conceives these signs will be of no avail. The cases which have fallen under my notice have been indicated by a sense of oppression at the chest, by cough, and by mucous and bloody expectoration, and a turgid but rather full pulse, without fever. They were protracted in duration, but ultimately removed, and perfect health was regained.—*Ed.*

to the pulmonary circulation. In the case of a princess who was seized with urgent dyspnœa, the vessels of the lungs are said to have been turgid *usque ad livorem* —*Morgagni*, xv. 17.

Inflammation of the mucous membrane of the bronchiæ.

Giovanni Francisco Barbadici, a cardinal of the church of Rome, nearly seventy-two years of age, and subject to catarrh, was attacked with an epidemic catarrhal fever in the night of January 22, 1730. He arose the following morning and exposed himself frequently to atmospheric influence; and even on the 24th he performed the duties of his office, but was constrained to take to his bed and seek medical assistance on that day. On the 25th he expectorated a large quantity of thick mucus, tinged of a yellowish red colour. His countenance and the colour of his skin were natural, his cough was easy, and he could assume the decumbent position on either side, at pleasure. He had no sense of weight, pain, or heat in the chest; he had but little thirst; his tongue was white and moist; the alvine excretions were natural, but the urine was turbid. His understanding was prompt, but when he sought any particular word he was unable to recollect it. His pulse was strong and frequent, and, though not hard, it was somewhat tense. The state of respiration accorded with that of the pulse, and was attended with a bubbling noise. The attack had hitherto been regarded lightly, but now it assumed a more serious aspect. On the 27th expectoration ceased, respiration became more difficult, and his thirst increased; but, in other

respects, he remained as on the preceding day. The pulse indeed was soft and less frequent, yet we were extremely anxious respecting the other symptoms, and especially because his cough continued as violent as before, whilst the quantity of sputum decreased, and, at length, he had ceased to expectorate. I left him, predicting every thing that was unfavourable unless expectoration returned. In the course of the night he was seized with augmented difficulty in breathing, and requested to be raised up. As soon as this was done he was found to be dying. The body was opened for the purpose of being embalmed.

Dissection. The spine had been distorted from childhood, so that it resembled the letter S; and in consequence of this circumstance the capacity of one of the thoracic cavities was contracted, but there was no serous effusion into either cavity. The superfice of the lungs was whitish, and appeared as if it had been smeared over with a kind of milk-coloured varnish. The lungs themselves were heavy, which was owing to the quantity of mucus with which they were loaded, and which issued forth in considerable quantity wherever the bronchial tubes were divided. The texture of the lungs, so far from being dense or compact, was found to be flaccid.—*Morgagni*, xiii. 3.

This epidemic catarrhal fever originated from atmospheric vicissitude; for a cold and dry air, with protracted serenity of sky, had succeeded a long course of incessant rain, southerly winds, and a warm and damp atmosphere. In general the symptoms were slight. The appearance upon the lungs, in the preceding case, which resembled

varnish, probably arose from the white humour, which pervaded the cells of these viscera, shining through the transparent membranes.—4.

Ossified cartilages; and calcarious concretions.

The cartilages of the trachea and bronchia sometimes become bony, even before the person is far advanced in years. Calculi are likewise sometimes formed within the bronchiæ. The bronchial glands within, and exterior to the lungs, occasionally become hard like gypsum. Yet I believe these calculi more frequently originate from the long retention of tenacious secretions within the ramifications of the bronchiæ, and in the air-cells. Many cases are extant in which the calculi are represented to have been coughed up; and in some of those instances they were considerable in number; and varied in magnitude, from the size of a millet seed to that of a pea or bean. They have been brought up when as large as a small peach-stone or a filbert nut, but this is an extraordinary occurrence. They are also described as having been found in the lungs equal to the size of a walnut, or of a pigeon's egg.—*Morgagni*, xv. 19, 20.

They usually resemble the concretions which are formed in the joints of arthritic patients, and consequently are friable, light, and chalky. An asthma or an orthopnœa is often found to accompany them; but more frequently they are attended with an obstinate cough, and not very seldom with hæmoptysis and phthisis.

In one of the recorded instances it is said there was no cough, but a continued pain in the right side. In another, the patient suffered acute pain

in the middle of the thorax, and discharged a large quantity of limpid water from the fauces.—21.

Although, even when calculi are expectorated, the patients more frequently die than recover, either because the concretions are not all ejected, or on account of others forming, or from the circumstance that the lungs had undergone irrecoverable disorganization; yet examples are not wanting of persons having not only lived a long time after expectorating these substances, but also of their having enjoyed good health without the aid of medicine.

Asthmatic symptoms have sometimes ceased after calculi have been expectorated. Zacutus and Wedelius relate instances of restoration to health, after sharp and rough calculi had been expelled from the lungs. One of them resembled the bone of the finger; others were smaller, but had acute angles. Though several authors mention the appearance of these concretions in such diseases as phthisis, cough, dyspnœa, hæmoptöe, asthma, and hectic fever, they do not specify the existence of pain; so that it would appear, from their observations, that no great degree of pain was experienced.—22.

These concretions being soft in the beginning, assume the form of the part or tube in which they are seated. The hæmorrhage resulting from them occasionally is so profuse as to destroy life.—23.

I shall subjoin one history of a calcarious lung, from that distinguished anatomist Malpighi.

A woman who was greatly emaciated was occasionally annoyed with cough, and difficulty of breathing; but these affections never were accompanied with expectoration of thick matter. The

symptoms underwent no alteration by her lying on the back or on either side; but she respired most freely when the neck was elevated. She experienced a sense of weight, as if something were hanging from the fauces into the thorax, and constringing the fauces. Malpighi conjectured that the lungs were *tartarized.*

When she died, and the thorax was opened, the accuracy of his diagnosis was confirmed by the crashing of the knife, as if sandy concretions were cut into, and was still further corroborated in the progress of the dissection,—*Morgagni*, xv. 25.

In a man who had been affected with a tumour in the neck, which ultimately proved fatal, several parts of the lungs were filled with globules of an earthy concretion; and these organs were universally pervaded with a great redundance of serum.*

Valsalva, xvii. 19.

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* Dr. Johnson has related an instance in which an abscess formed in the lungs produced caries of the ribs, and afterwards burst outwardly. The right lung was converted into a mass of calcarious matter, cartilage, and a solid substance like indurated liver.—*Med. Chir. Journal, March*, 1817.

Dr. Marcet, in his Work on Calculi, has mentioned the existence of a white incrustation of a triple phosphat on the surface of one of the lungs.

A case recently occurred to me in which a concretion, the size of a french bean, had formed in the lung; and the external portion of the viscus, corresponding with the earthy body, exhibited precisely the appearances of a cicatrix.

It is well known that hydatids form in the pulmonary tissue. In a case, the symptoms attending which had been those of phthisis, M. Prost found two cysts, one of which was the size of a pullet's egg, and its parietes were partly cartilaginous and partly ossified.

Ossification of the cartilages of the larynx and air-tubes is not a very unfrequent occurrence.—*Ed.*

*Phthisis Pulmonalis.**

Case 1.

A middle-aged man, who was a proficient in music, and who three years before had a cough,

* Amongst the numerous and excellent works which have been written on pulmonary phthisis, perhaps I am warranted in saying that the most luminous exposition of this malady has been derived from the pen of Dr. Bayle; and I shall avail myself of his, as well as of M. Portal's investigations, for a preliminary note to Morgagni's cases. Dr. Bayle maintains, in the first place, that "every injury of the lungs, which, left to itself produces a pro-"gressive disorganization of them, and in the end ulceration "and death, ought to be called pulmonary phthisis." In the second place he shows that the diseases most frequently confounded with phthisis are principally catarrh, peripneumony, and pleurisy, when they follow a chronic course; and that pulmonary chronic catarrh only affects the mucous membrane and not the parenchyma like phthisis. He also shows that effusions of purulent or puriform matter, in one or both sides of the chest, are often mistaken for phthisis. In the third place he distinguishes the following species of pulmonary phthisis, but admits that many of them are sometimes united in the same person. 1, Tubercular phthisis; 2, granular phthisis; 3, phthisis with melanosis; 4, phthisis from ulceration; 5, phthisis from calculi; 6, phthisis from cancer.

When exposing the nature of his *first species* he observes that the tubercles may be encysted or not encysted; that they vary in size; and are found in different states; namely, firm—soft in the centre—transformed into clotted purulent matter—and ultimately destroyed by suppuration. These ulcers are almost always covered by a distinct membrane, which secretes the pus. When this membrane is not found, there is always an albuminous membraniform bed which supplies its place, except where a suppuration has occurred in that part of the tissue of the lungs which became inflamed at the time that the softening of the tubercular unencysted degeneracy took place. In this case the inflamed substance and the tubercle are destroyed together, and the tubercular is united to the ulcerated phthisis. The membrane

with bloody expectoration, experienced a return of the hæmoptysis, which was followed by a copious

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surrounding the tubercle sometimes appears continuous with the mucous membrane of the bronchiæ.

In the *second species* the lungs are stuffed with miliary granulations—transparent—shining—sometimes speckled—and of a cartilaginous nature and consistence. At length they occasion ulceration of the parenchyma; an albuminous membraniform stratum lines the ulcer; and often, a distinct membrane, which lines the walls of the ulcer, secretes the pus.

The *third species* exclusively affects adults. The ulcers are of various sizes, as black as coal, and very hard; sometimes they are a few lines thick, and at others a few inches. If the disease affects an entire lung, it is hard, compact, black as ebony or charcoal, and sometimes it resembles half-burnt leather.

The *fourth species* is very rare. The tissue ulcerates, and the ulcer is never covered by an albuminous membraniform layer, nor by any distinct membrane. It exhales a fetid and gangrenous odour. Its surface is unequal and irregular, covered with brown decayed parts, and generally exhibits traces of recent or remote hæmorrhage. The ulcer is sometimes large enough to contain three pullet's eggs.

The *fifth* and *sixth species* are much more unfrequent than the fourth, which will be shown by the following table of relative frequency in nine hundred dissections:—

First Species, 624—Second, 183—Third, 72—Fourth, 14—Fifth, 4—Sixth, 3=900.

The larynx and trachea, the intestines and, perhaps, the whole alimentary canal, and the mesenteric and cervical glands, are often diseased in phthisis.

The nature of tubercles seems not yet to have been decided. I believe they have never been injected; but the cyst, unquestionably, is vascular. Portal considered them of a glandular nature, but Dr. Baillie, and other anatomists, deny the existence of glandular structure in the cellular connecting membrane of the lungs; and Dr. B. affirms that " on the inside of the branches of the " trachea, where there are follicles, tubercles have never been seen." Morgagni entertained the opinion that there were no

excretion of thick and offensive matter. He could lie on either side, and had no pain in the thorax.

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lymphatic glands in the lungs. In an essay on the pulmonary glands, Portal, however, attempts to prove the distinction between the lymphatic glands of the lungs and the bronchial glands, and as the subject is one of lively interest I shall give an abstract of that article. Naturally, he says, the lymphatic glands are very different in their structure and situation from the bronchial: they are much smaller, and also rounder and harder to the touch, and resemble the other lymphatic glands. But the distinction between them, in the morbid state, he found more remarkable than in the natural; having frequently observed most of the bronchial glands altered in lungs, whilst the lymphatic glands were perfectly healthy; and *vice versa.* In reference to Morgagni and others who entertained the opinion that there are no lymphatic glands in these viscera. Portal observes, "*Les médecins praticiens ne distinguent jamais "les alterations de ces glandes, soit qu' ils parlent des tubercules "formes dans les poumons des asthmatiques, soit qu' ils traitent "de la phthisie de la naissance, ou d'autres espèces de suppu- "rations du poumon; c'est presque toujours d'une manière vague "et en confondant celles qui affectent ces deux espèces de glandes, "quoiqu' elles diffèrent entre elles aussi essentiellement que les "parties dans lesquelles elles ont leur siége.*" He considers it indispensable, however, to make a distinction, before a correct idea can be formed relative to phthisis, and consequently before any truly efficient remedies can be employed. Like the other lymphatic glands, he found those of the lungs presented considerable diversity of morbid appearances, and particularizes obstruction, inflammation, and suppuration. In five persons who died of phthisis, but who had not expectorated pus till a short time before death, the lymphatic glands were affected in different ways. Some were enlarged and filled with a chalky substance —such as is often found in glands of this nature; in others, the substance had softened and become puriform; others were in a state of suppuration, and the adjacent substance had ulcerated. He explains the varieties in the degree and seat of pain, by referring to the adhesions which take place between the lungs and pleura, the diaphragm or other parts: and the aphonia or

It was at night, and especially after supper, that he was chiefly molested with cough. His respiration

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paraphonia, which is sometimes very remarkable in phthisical persons, he ascribes to an injury of the recurrent nerves, from those parts of the lungs which receive branches from these nerves being diseased.

In the *phthisie de naissance*, or hereditary phthisis, he maintains that the lymphatic glands are the seat of the disease, and the bronchial either sound or only secondarily affected. In three infants of M. B—— which died phthisical, Portal found the lungs full of concretions, some were red, and, as it were, fungoid; others appeared to possess the nature of wens; others were as hard as scirrhi, and some were suppurated. Most of the bronchial glands were healthy, but some which were contiguous to the lymphatic glands, had undergone a change in their appearance. He was confirmed in the opinion of the lymphatic nature of this disease from the circumstance, that the glands of the mesentery, those along the neck, the œsophagus, &c. were swollen and full of a gypseous matter.

Portal sur Plusieurs Maladies.

Morgagni avouched the hydatid origin of tubercles on the pleura and peritoneum, and in the texture of the viscera; and this subject has been ably dilated upon by Drs. Baron and Jenner.

Whatever opinion is entertained as to the precise texture of tubercles, all agree that their formation is connected with a morbid state of the lymphatic system. M. Broussais maintains that, as it is the superior developement of the nervous and sanguiferous systems which disposes certain persons to the neuroses, to acute inflammations, and to hæmorrhages; an analogous constitutional disposition, in which the lymphatic system enjoys a remarkable predominance of action, is the organic condition which renders other persons so liable to morbid enlargement of the lymphatic glands. The scrofulous diathesis, he considers to be merely the lymphatic constitution carried to the highest degree; and which may be transmitted from parents to their children, just as the sanguineous and nervous temperaments may be transferred.

It may be doubted whether the suppuration which existed in

was difficult, particularly on making exertion, though the effort might have been but slight. His thirst was urgent, and, after taking food, the stomach was oppressed. For some weeks preceding death he had frequent nocturnal sweats, and his feet became œdematous. Diarrhœa came on, and he voided a large quantity of serous matter. At length he died suddenly, when attempting to dress himself.

Dissection. The lungs were filled with tubercles. The upper lobe of the left lung, contiguous to the sternum, was extremely indurated, and was occupied by an abscess of considerable extent, which contained matter of a pultaceous consistence. Nearly half a pint of serum was found in the right cavity of the thorax, and not much less in the pericardium. When the pericardiac fluid was evaporated, it merely left a pellicle at the bottom of the vessel.—*Valsalva*, xxii. 14.

Whilst Valsalva dissected this case, he said, that in all the consumptive patients he had examined till that time, the lungs were diseased in the upper part.

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some of Morgagni's cases might not have been the consequence of peripneumony; but I think in most, if not in all of them, there exist traces of a strumous habit. Some of them evince that complication of organic mischief so common in scrofula. Morgagni accounted for his having but few dissections of this disease by acknowledging his apprehensions of its being infectious; and Portal long hesitated to examine these bodies under a similar impression: but he totally relinquished this opinion afterwards. *Ed.*

Case 2.

A prostitute about twenty years of age, had, for several months, laboured under slow fever, cough, illaudable expectoration, and marasmus. She complained of pain in the left side of the thorax, so that decumbence on that side could scarcely be endured. She was distressed with difficulty of respiration, and had rather copious hæmoptysis; but the expectoration was restrained, and two days afterwards, when a gale was blowing from the south, which is always unfriendly to phthisical persons, she expired.

Dissection. The right lung adhered to the ribs but little, but the viscus on each side abounded with hard tubercles, inclining to a white colour, and resembling the appearance of glandular bodies. The upper lobe of the right lung was in a state of suppuration; and the corresponding portion of the left contained a hard substance equal to the size of a large pear, which in some degree resembled the texture of an indurated pancreas; and in the centre of this substance there was a small abscess filled with pus. The pericardium contained a small quantity of serum.*

Valsalva, xxii. 15.

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* The large substance mentioned as occupying the left lobe may be somewhat elucidated by the following case of phthisis.

On the 8th of September 1814, I was desired to see a poor girl æt: 14, who had been drooping for two years, though she had not appeared to be really ill for more than three months, and the illness was attributed to a suspension of the catamenia, which had appeared at a very early age. The parents of this poor girl had not applied for relief before, from an ill-applied, but honest,

Case 3.

A young woman twenty-four years of age, was annoyed with a troublesome cough, after hæmoptysis. At first she expectorated mucus, but at length the sputum presented a puriform appearance. She had a degree of fever, and complained of a pain in the thorax, especially on the left side, on which she was unable to lie down. The body wasted, the feet were somewhat œdematous, and

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principle. I found her under decided hectic fever; and the progress of pulmonary disease had been so exceedingly insidious, that her mother denied the existence of any material degree of cough or dyspnœa. The most distressing circumstance of which the girl now complained, was excessive diarrhœa. After a few days attendance, and directing particular attention to the state of respiration, it was observed that she breathed with difficulty, coughed frequently, and expectorated pus. I discouraged all expectation of recovery. She died October 4th.

Dissection. The pleuræ were universally and firmly coherent; indeed the union was so firm that on attempting to disconnect them, either the pleura pulmonalis was torn from the lungs, or the pleura costalis from the ribs. The lungs were occupied by tubercles and vomicæ; but in some of the lobes there was an irregularly circumscribed, though not encysted consolidation, which exceeded the size of a large walnut, and was converted into a whitish substance. In the centre of most of these structures, there was a very slight fissure in which suppuration appeared to be commencing; but on comparing them with the tubercles in other parts of these organs, I was led to consider them of the nature of medullary sarcoma, or the tubera diffusa: and I suspect the large body described by Valsalva was of a similar character.

Some parts of the mucous coat of the intestine were thickened and ulcerated, as is generally found when diarrhœa comes on in an advanced state of consumption; but though the lesion is more particularly manifested upon the mucous surface, it probably originates in the glandular tissue.—*Ed.*

some days prior to death, the right foot was affected with erysipelatous inflammation.

Dissection. The left cavity of the thorax was filled with a serous fluid, and in some places, small coagula of blood adhered to the costal pleura, and to the lower border of the lung. The pleura was exceedingly red, as if it were inflamed; and the lung was greatly indurated. The opposite thoracic cavity contained only a small quantity of serum, and the pleura was in a healthy state. The pulmonary structure, contiguous to the clavicle, was somewhat hardened; and an abscess occupied the centre of this indurated portion.

Valsalva, xxii. 16.

In this instance peripneumony appears to have terminated in phthisis; and there was a complication with hydrothorax.—*Morgagni*, 17.

In the following case the lodgment of matter was in that form to which the appellation *empyema* is applied.

Case 4.

A stripling about eighteen years of age, who had apparently recovered from inflammation of the right lung, experienced a renewal of fever, accompanied with thirst, cough, and purulent expectoration. He was unable to lie, even for a short time, in any other position than on his right side. His face swelled, and his abdomen became tumid. After suffering under these symptoms for two months, he died.

Dissection. The abdomen was occupied with a large quantity of limpid serum, but there was no

visceral disease. The right cavity of the thorax was filled with pus, and the lung on that side was so reduced in bulk, that, at first, it appeared to be wholly wanting. Whilst moving the body, pus issued from the trachea; but no abscess was found in the lung, at least as far as the intolerable fetor allowed us to investigate. In some places, however, there were small tubercles, which emitted a little pus. The pleura costalis was exempt from disease, but the pericardium was replete with serum.—*Valsalva*, xxii. 6.

Cases have been observed, in which a part or the whole of a lung has been destroyed by ulceration. An instance occurred to Haller in which the left lobe of the lungs had totally disappeared, and in its stead he found an abundance of a rather offensive fluid, which was viscid, like the white of an egg. It was a remarkable circumstance, too, that the larger arteries and veins appeared as if they had been cut through, and were so evidently gaping at their extremities, that it was difficult to conjecture by what means hæmorrhage had been counteracted. The progressive accumulation of pus in the thorax must tend to compress the lungs within a narrow compass; and where they have been surrounded by a large quantity of water they have undergone so much compression as to excite a suspicion of having been totally wanting.*

Morgagni, 7.

* Instances have occurred in which after the discharge of large quantities of pus from the thorax, either through the parietes of the chest or by the mouth, the patient has recovered; and after death, from other causes, it was found that respiration had been

Case 5.

Inflammation of the diaphragm and brain in phthisis.

A tall and slender man, who, being a hemp-dresser, was subject to thoracic inflammation. He had been affected in this way six or seven times. On one occasion the pulmonary affection was attended with bilious vomiting, and on another with phrenitis; and ultimately his organs of voice were so perverted, that he might be said to clang rather than to speak. By keeping tolerably free from the dust of his occupation he had nearly recovered his voice, when he was seized with febrile rigors, and a piercing pain beneath the left mamilla. He was brought into the hospital about the middle of February, and though he had previously been bled, yet as he respired with difficulty, and did not expectorate any thing, the abstraction of blood was repeated. He often lay on the affected side. He vomited green bilious matter. On the fifth day phrenitis came on, and sometimes presented a joyous, sometimes a grave, at others a furious character. He was again bled, and a medicated cataplasm was applied to the abraded scalp. Convulsive motions ensued, which commenced with subsultus tendinum, but afterwards became more violent. His respiration was not difficult. When asked if he felt pain anywhere, he replied in the negative, though he sometimes cried

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carried on by one lung, the other having been destroyed. In the preceding case the accumulation of pus might have resulted from common inflammation; but the tubercular state of the lungs denotes scrofulous diseases.—*Ed.*

out as if he was in pain. His urine flowed involuntarily; his pulse became irregular; and he died at the close of the seventh day.

Dissection. The right side of the neck had a livid complexion. When the abdomen was opened the border of the liver was of a livid hue; the gall-bladder was contracted, and contained but little bile, which was of a dilute tobacco colour. The pancreas was thickened, and somewhat indurated.

The right lung was closely united to the ribs and diaphragm in every part; but the left in a few places only. On the contrary, the substance of the right lung was healthy, whilst the greater part of the left viscus was diseased. A suppurating tubercle was situated in the upper lobe, and the inferior lobe was red, indurated, and dense in its texture; and its upper part contained pus, or matter like pus. The pleura was inflamed, and easily drawn away from the ribs. The tendinous centre of the diaphragm was inflamed, so that its minuter vessels were conspicuous. The pericardium contained some turbid and bloody serum.

The vessels in the membranes of the brain were exceedingly turgid with blood; the pia mater was generally red from its injected vessels; and serum was effused beneath it, in the convolutions of the brain. The lateral ventricles contained a small quantity of bloody serum, and there were numerous and not very small hydatids on the posterior surface of the choroid plexuses. The vessels distributed upon the parietes of the ventricles were unusually turgid with blood; and when either of

the corpora striata, or of the thalami nervorum opticorum, or any other part of the medullary structure was slightly scraped, or deeply cut into, vessels equally loaded and conspicuous every where presented themselves; but in the cortical substance of the cerebrum and cerebellum scarcely any were distinguishable.*—*Morgagni*, vii. 13.

Case 6.

Pulmonary phthisis, with cartilaginous bladder.

A man fifty years of age, having undergone excessive fatigue in travelling, complained of pain in his chest, and expectorated a large quantity of matter. He was most comfortable when lying with his head bent forwards. His feet and abdomen were tumid, he was very thirsty, his respiration was rather panting than breathing; and this function was peculiarly oppressed after he had taken food. To these symptoms hæmoptysis was added. However, the spitting of blood ceased; and for nearly the space of a month he was wholly free from pain in the chest, though the other symptoms continued. During the three or four latter days of his life he was

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* There seems but little doubt that this was a case of true tubercular phthisis. Delusive amendments, and unexpected accessions of acute disease, are well known to occur frequently in this dreadful malady. It may be a form of disease which suddenly develops the pulmonary affection. But instances have occurred to me in which life had been terminated by affections in which the lungs scarcely appeared to be involved; when, on examination after death, these viscera were found to be extensively disorganized by strumous lesion. It has often appeared surprising that extensive structural disease should have taken place without being manifested by hectic fever or by any other marked symptoms.—*Ed.*

unable to lie on the right side; and, at length, a large quantity of blood suddenly gushed from the lungs, and the man was suffocated.

Dissection. The abdominal cavity was filled with a yellowish fluid, not unlike the serum which exudes from coagulating blood; and no lymphatics were discoverable any where. The spleen was equal in magnitude to the natural bulk of the liver, and was firmly united to the adjacent parts. The size of the liver appeared to be somewhat diminished, and the substance of this organ, as well as its superfice, was pallid. The coats of the gall-bladder were very considerably thickened. To some parts of the parietes of the urinary bladder cartilaginous substances adhered. The right lung exhibited no unnatural appearances, except considerable redness at the lower part; but the left lung was pale, reduced in bulk, and indurated. It contained pus, and was so adherent to the circumjacent parts that it appeared to form one body with them. The pericardium was universally adherent to the heart.—*Valsalva*, xxii. 4.

In proportion as blood was excluded from the vessels pervading the left lung, those vessels which ramify through the right appear to have acquired turgidity.—*Morgagni*, 5.

Case 7.

Pulmonary phthisis, with tuberculated peritoneum.

A girl who had been affrighted was seized with fever, accompanied with pain in the thorax. The parotid glands, and almost all the glands of the neck, were enlarged. She died.

Dissection. The abdomen contained a small quantity of limpid serum, and the omentum adhered by small filaments to the mesentery and peritoneum. These three parts, as well as the surface of the intestines, uterus, and gall-bladder, were rough from protuberating bodies, having a diversity of form and magnitude. Those in the upper part of the omentum were very small, and more distant from each other; and those in the lower part were large and aggregated.

In the left lung there was not only an abscess, but also bodies similar to those which were found within the abdomen. Some of these tubercles contained pus; some contained matter nearly of a pultaceous consistence; and the solidity of others gave them a resemblance to the texture of conglobate glands.—*Valsalva*, xxii. 18.

Morton has justly observed, "*mirum non esse, si "scrophulosi, qui tumoribus glandulosis in aliis "partibus frequenter obnoxii sunt, non raro etiam "ejusmodi tuberculis vel in ipsis pulmonibus affici-"antur:*" and of strumous phthisis he says, "*certissimum diagnosticum sumendum esse a tumo-"ribus glandulosis in externo habitu corporis eam "comitantibus.*" This opinion my own observation has confirmed, and other cases are extant in the Sepulchretum. One of them demonstrates a threefold variety of matter, contained in these tubercles; some were filled with pus, others with a substance like honey; but the greater part, and these of the smaller size, were filled with a kind of steatomatous matter. This was probably of the same nature as the contents of tubercles, in the case of a boy

mentioned by Valsalva, which, in colour and consistence, he said, resembled the medullary substance of the brain. These and other appearances present themselves in the progress of the disease, according to the varieties of cause and constitution. Before the disease has made any considerable progress, the tubercles are solid and resemble conglobate glands. Indeed, during the first years of their existence, they may be so minute as in a great degree to elude discovery; but they are developed as the person advances in life, and at an earlier or later period, as suitable causes to excite the disease into action may be applied.*

Morgagni, xxii. 19.

Consumptions may arise from a constitutional or an adventitious cause; and considerable diversity will be observed in the state of the lungs. It will be found in different cases, that both the appearance and the odour of pus are dissimilar; and sometimes it exists in conjunction with the indurated part of the lung, and, at others, these are separate lesions. One part has been in a state of suppuration, whilst

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* In the interesting case which led to these remarks on tubercles, the parotid glands are said to have been enlarged as well as all the glands of the neck. I believe the salivary and other conglomerate glands are but seldom implicated in true scrofulous diseases. The glands so frequently enlarged in the neck, and other parts, where this diathesis prevails, it is understood, are the lymphatic or conglobate. That form of fungoid tumours designated *tubera diffusa*, and so well described by Dr. Farre, is perhaps often mistaken for a scrofulous disease. "No texture" says he, "seems to escape the ravages of this fungus. It appears indifferently in all the viscera, in the cellular membrane, and even in the bones."—*Ed.*

another was almost tophaceous: one lung has contained pus, when the other was indurated. In some persons the lungs are full of scirrhi of a cartilaginous hardness; or they are filled with hard steatomatous tumours: and in others they are occupied by small abscesses or vomicæ. In some they are of a callous or compact texture, in others they are disorganized by vomicæ and tubercles.—20.

Case 8.

Pulmonary phthisis, with hydrothorax, hydrops pericardii, and abdominal disease.

A woman forty years of age, who resided in the country, had a tumour on the inner side of the right heel, which increased to the magnitude of a man's head. It was extirpated in the hospital of Incurables at Venice, but, twelve months afterwards, it began to grow again, and about the same time she was seized with an acute pain in the left district of the thorax, accompanied with fever and difficulty of respiration. Blood was repeatedly withdrawn, which exhibited a buffy coat. About the fortieth day after the commencement of peripneumonic symptoms, the difficulty of breathing was attended with a sense of tightness and suffocation, so that when decumbent she required to have the head and back elevated. Her pulse, which had been intermittent during the inflammatory symptoms, had intermissions now of a more marked character. She experienced no pain, nor did she cough or expectorate; and she was exempt from fever, except for some days immediately preceding death, during which period she was slightly affected

with febrile symptoms. The difficulty of respiration became more oppressive, especially in the night, and she was reduced to a state of extreme emaciation and debility. She spoke with an exceedingly weak voice, and complained of soreness of the fauces. In the beginning of April 1708, on the fifteenth day after the renewed difficulty of breathing arose, she died.

Dissection. As soon as the cartilages of the ribs were divided, bloody serum issued from the left cavity of the thorax, which was found to be full of the same fluid. The lung was extensively ulcerated at the lower and anterior part, so that a large cavity presented itself to the eye, and pus was mingled with the fluid. When this lobe was dissected it exhibited, in some places, considerable portions of substance, which, at the first view, resembled steatoma, from its white colour and firm texture; but on more attentive examination it appeared to have a greater resemblance to purulent matter. The remaining part of this lung was tinged with a red colour. The right lobe contained fewer of those steatoma-like tumours, which were less in size, and appeared to be included in their peculiar tunics. Both lungs adhered to the parietes of the thorax. The pericardium was distended with a great redundance of turbid and yellowish serum.

The intestines were inflated with gas. There was scarcely any vestige of omentum. The liver was somewhat hard, pale, and variegated; but the gall-bladder was full of bile. The spleen greatly exceeded its natural bulk, and was of an unusually firm texture; and the pancreas was considerably

indurated. The ovaria were white, hard, and considerably enlarged; and likewise contained some small dark-coloured cells. In the upper part of the vagina I found a ring pessary, but when it was removed the vagina did not appear so relaxed as to render it probable that, had she been alive, prolapsus would have occurred; and the uterus was in its proper situation. Accordingly I inferred that the woman had been essentially benefited by the pessary, and by the recumbent position.

Morgagni, xxii. 22.

Case 9.

A portion of bone expectorated in phthisis.

A physician of middle age, whose countenance had long betrayed a cachetic disposition, and who afterwards experienced difficulty of breathing and hoarseness, began at length to expectorate a variously-coloured sputum, with which he also coughed up a small curved bone. He showed it to me, and I found it not very small in size: it was smooth on its concave surface, and rough on its convexity. He was often afflicted with a sense of suffocation, and ultimately, was found dead in his bed, a few hours after he had represented himself better. His decease had been so quiet that another person sleeping in the same bed was unconscious of its having happened.

Dissection. The lungs, both internally and externally, were pervaded by vesicles full of pus. They were of various sizes, but the largest did not exceed the magnitude of a grape. The pericardium contained a large quantity of turbid serum.

Valsalva, xxii. 24.

It seems probable that the bone was a portion of one of the rings of the trachea, which had become ossified; for we know that the air-tubes have undergone this change of texture in phthisical persons. Valsalva, indeed, conjectured that it had been detached from the larynx, the larger cartilages of which unquestionably often become bony.

Morgagni, 25.

Bronchitis, sometimes mistaken for phthisis.

It is proper to be aware, that some examples of restoration from phthisis may refer rather to affections of the trachea than to disease of the lungs. I shall describe a case which occurred to me when young, and by which I obtained great reputation. The subject of the case was an industrious man at Lucca, who was constantly occupied in business of great importance, and was oppressed with numerous anxieties, by which circumstances he was rendered hypochondriacal. For a long time he had been troubled with a cough, and with bloody expectoration. The senior physicians employed a variety of expedients, but their efforts were futile. He became increasingly emaciated, and was as weary of the physicians as they were of the disease; and at length he came to me. I undertook the management of the case with extreme reluctance; and indeed my ultimate compliance was rather that he might not be forlorn than with any expectation of removing the disease. When, however, I found that continued fever did not exist—that there was but little purulent and bloody sputum—and that a sense of pain was only perceived in the trachea,

a little below the larynx, I secretly cherished some hope that the man might possibly recover. I directed him to confine himself in a warm but amply spacious chamber, and to speak but little, and then in a low tone. He took human milk, in small quantities at first, but finding it agree well with him, he sucked about half a pint morning and evening, some hours before dinner and supper. The meals were ordered to be moderate in quantity, and wine to be avoided. His dinner and supper often consisted of farinaceous articles, with milk; and his medicines were of the demulcent class. He strictly observed this regimen from the end of November to the middle of May, when he had so far recovered that he enjoyed good health for sixteen years afterwards.*

Morgagni, xxii. 27.

There are deeper seated affections also of the trachea, which are not unfrequently confounded with consumption, though the lungs in these persons are exempt from lesion. I remember Valsalva to have related, that he never found the lungs in a more natural state than they were in Zani, Bishop of Imola, though, from the quantity of matter expectorated, they were generally supposed to be diseased. The sputum in such cases is undoubtedly secreted by the bronchial glands, and though it is not pus it occasionally bears so great a resemblance to it, that some method

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* This case and the following indicate that Morgagni very early appreciated the advantage of regulated temperature in the treatment of pulmonary disease.—*Ed.*

of unequivocal discrimination is yet a desideratum.*—28.

I do not deny that truly consumptive patients may occasionally have been cured, especially in the early stage of the disease. I presume, however, that restoration happens very rarely—more rarely than they imagine who have had no experience how much assiduity on the part of the physician, and what rigid compliance on the part of the patient are requisite, to remove even those diseases which, though resembling consumption, are not of that nature. I will give a case, and leave the reader to form his own opinion as to the name by which it should be designated.—30.

The Count of Feltri being annually subject not only to a troublesome affection of the gums and teeth, as his noble brothers were, but also to ulcerations of the nostrils, and herpetic diseases of the skin; and having often in the autumn been exposed to the morning's cold in hunting, he was seized with violent catarrh, to which cough was added, and, at length, in November, he began to spit blood. He was repeatedly bled, and took goats' milk, ivory and calves-feet jelly, which was prepared with water in which hot steel had often been cooled; and other remedies of an astringent property were administered. This plan was

* Dr. Young has suggested an exceedingly simple method of discriminating between pus and mucus; namely, to place the sputa between two glasses, when the globules of pus may be discovered. By looking through them at a distant candle he says "we shall observe, even in the daytime, a bright circular corona of colours."—*Ed.*

pursued through December, and the disease appeared to be removed, though the cough returned occasionally; but in the month of March all the symptoms re-appeared. Notwithstanding slight alleviation, the cough and hoarseness continued to distress him, and the expectoration, which had been whitish, assumed a different colour, became heavy, and glutinous. A sense of constriction of the chest and of heat beneath the sternum, was united to the preceding symptoms. At this period the cutaneous spots were of a pale colour and free from itching. His strength of body, vivacity of countenance, and vigour of mind had evidently declined; and he became increasingly emaciated. About the end of June I was consulted by letter; and whilst there appeared many circumstances to excite alarm, there were some which prevented us from being hopeless. He had easy sleep at night, a capacity of lying on either side, a continuance of appetite for food, and the pulse was not accelerated after taking nutriment. There was no fetor in the sputa; nor did he experience a sense of weight in the chest, or difficulty of respiration. And though soon after this account was sent me, he expectorated some bloody pus five or six times, by violent coughing, I did not alter my opinion; especially as I was informed that he had made no complaint of a sense of heat and constriction after that period. The treatment chiefly consisted in the daily use of resin terebinthinæ and various preparations of herbs. He experienced amendment and was able to visit me; and my hope of a favourable termination, and his confidence, were both strengthened. The

conformation of his thorax was good—it did not recede from the broad bones of the scapulæ, and thus render them prominent like wings. His cough, expectoration, and emaciated state of body, however, continued, and gave me pain. The sputa were of a yellowish and cineritious colour, especially in the morning, and of a saltish flavour. Though the cough was diminished, it was still troublesome morning and evening, and seemed to arise from irritation in the upper part of the thorax.

The cold season was approaching, which he was obliged to pass in his bleak native place, where the cold is severe and protracted. On this account I again urged the necessity of strict attention to defend himself from atmospheric inclemencies, and to persevere in the use of remedies, the chief of which was milk, at first from the ass, and afterwards from the cow. He returned home, and having taken ass's milk during a month, the sputum presented a more hopeful appearance. He then adopted the cow's milk, and by the end of December all irritation had ceased and he appeared well. So much did one kind of remedy effect, in an unfavourable place and season, when aided by the assiduity and caution of the patient, and when all the efforts were crowned with the Divine benediction.—*Morgagni*, xxii. 31.

SECTION III.

Diseases of the Heart and Blood-vessels.

Diseases of the pericardium.

The pericardium thickened.

The pericardium has often been found thickened to a considerable extent; and the symptoms have been modified by the co-existent disease. Hottinger found it thick like buff leather, very hard, and closely adherent to the heart. The only symptom was a difficulty of breathing.

Laubius found it as thick as a man's thumb, and as hard as cartilage, whilst the heart itself was small. The symptoms were those of violent asthma.*—xxiii. 18.

Adhesion of the pericardium to the heart.

In cases in which the pericardium has been found adherent to the heart, a circumstance by no means unfrequent, the symptoms have been variable. In some instances there was palpitation of the heart; in others there was shortness of respiration on the slightest motion, a small and intermittent pulse, a troublesome pain about the præcordia, with great oppression and frequent

* Cases of inflammation and thickening of the pericardium have already been described—p. 272. Dr. Baillie never saw the pericardium cartilaginous, but for an instance of this conversion see p. 275. Ossification of this bag will be mentioned when describing that morbid state in the heart itself.—*Ed.*

deliquia; but palpitation is not mentioned to have existed: and persons have sometimes experienced a sense of uneasiness in the heart, of anxiety at the præcordia, or difficult respiration. Dionis observed violent and continual palpitation, with difficulty of breathing, and a strong and quick pulse. Ruysch, relating a case in which this adhesion had taken place from inflammation, only particularizes amongst the symptoms, intolerable pain in the anterior part of the chest, and continued fever. Difficulty of breathing and palpitation have sometimes been induced not only by exertion of the body, but also by mental emotions. Hieronymus Queye observed this in a case in which the pulse was perpetually unequal and intermittent; and in another case the patient had been subject to unusual palpitation, and sudden but momentary intermission of the pulse, and to frequent but evanescent swoonings.—xxiii. 18.

Case 1.

Universal adhesion between the pericardium and heart; and disease in the aorta.

A man forty years of age had a tumour growing beneath the skin on one side of the occiput. It degenerated into an abscess, and carried him off. He never made any complaint of the thorax, nor of any difficulty of respiration. There was no inequality of the pulse, nor was it frequent or slow; but its strokes were feeble and slender.

Dissection. The pleuræ were universally adherent; and the lungs were flabby, and extremely fetid. The pericardium adhered to the heart universally.

The aorta exhibited considerable evidence of incipient ulceration, and still more decisively displayed the rudiments of ossification in several places, where it descended upon the thoracic vertebræ.—*Morgagni*, xxiv. 11.

In a boy whose body was examined by Valsalva, there was adhesion of the pericardium to the heart, but he observed nothing except emaciation. In two men in whom the adhesion existed there was no palpitation, nor any peculiarity in the pulse, though in one of them the pericardium was in some places cartilaginous. This man had complained of constriction at the chest. I have found the pericardium universally adherent to the heart in seven bodies. In only one of them was there an intermitting pulse and palpitation, and this arose from a very close adhesion of the pericardium, not only to the ventricles and right auricle, but even beyond the basis of the heart, to the root of the great vessels.—*Morgagni*, xxiii. 21.

In observations made by that assiduous and cautious man Albertini, so far from mentioning palpitation as a symptom, he says that he had rather observed the motions of the heart restrained, so that they could scarcely be perceived; and if palpitation and intermission do occasionally exist, it is in consequence of some other affection, as enlargement of the heart.—22.

It is highly probable that some of those cases in which the pericardium is said to have been wanting, were instances in which the pericardium had become closely united to the heart. Haller entertained this opinion. Indeed, unless the parts

are accurately examined, an error may readily be committed.*—18.

In the following case, partial adhesion of the pericardium, and thickening of the proper membrane of the heart, were attended with symptoms of *asphyxia.*

CASE 2.

Partial adhesion, with thickening of the pleuritic coat of the heart, and fluid in the pericardium.

A man fifty years of age, who had recovered from peripneumony, relapsed into disease of the thorax. Besides complaining of thirst and dry cough, he was unable to lie on the left side; and as often as he attempted it, by turning a little to that side, a sensation of swooning came on, and increased as he continued to turn. He averted its completion, however, by regaining the supine position, or by lying on the contrary side. No pulsation could be perceived.

Dissection. The pericardium was greatly dilated, and filled with pus diluted with a large quantity of serum. The investing membrane of the heart was extremely thickened, and from this to the pericardium two firm cylindrical productions, like thick and short ligaments, proceeded. One of them originated near the right auricle, the other from the apex of the heart;

* Dr. Baillie says, "When there is adhesion of the pericardium to the heart, this membrane adheres at the same time "closely to the tendinous part of the diaphragm; but when there "is original want of the pericardium, the heart lies loose in the "cavity of the chest." He had seen one example of this defect, and described the case in the Medical and Chirurgical Trans. vol. 1.—*Ed.*

and this was so tense, that at the time of the systole the apex of the heart could not be brought towards the basis, unless it drew with it the pericardium, and consequently the diaphragm.

Valsalva, xxiv. 2.

The asphyxia was partly attributable to the confined state of the heart, so that it could scarcely perform its office, even slightly: and, without doubt, the inability to turn on the left side arose from the great quantity of matter which distended the pericardium, and which increased the resistance made to the contraction of the heart. Many cases, however, have occurred, in which no asphyxia arose from adhesion; and I apprehend that it was chiefly occasioned by the state of the membrane of the heart, and the fluid in the pericardium.*—*Morgagni*, 3.

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* Adhesion of the pericardium to the heart is a frequent result of rheumatic inflammation; and the lymph which is effused and concreted on the surface, not only forms a thick white membrane, but often presents a granular appearance. The heart will mostly be found enlarged in these cases. I shall only relate the following instance.

James Off, about fifty-six years of age, had for seven years been a subject of rheumatism, with which he was chiefly affected in his hands, arms, and knees. About three years before death he experienced difficulty of respiration, with cough, and evening perspirations. He frequently was conscious of a sense of "fluttering" in the region of the heart, particularly when coughing. His breathing was most oppressive at night; and often when lying down, he was menaced with suffocation. His bowels were relaxed; he had but little appetite; his face was flushed; and during the last few weeks of life, his legs and arms swelled.

Dissection. On dividing the integuments of the thorax, bloody serum escaped from the cellular tissue, and a smaller fluid issued from the chest, as soo n as the scalpel had severed the cartilages

Abscess and tumours in the pericardium.

Numerous small abscesses occasionally form in the pericardium as a sequel of inflammation.

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of the ribs. I found that it proceeded from the substance of the lungs in consequence of the pleura pulmonalis having been scratched with the instrument. The lungs were so turgid with fluid, as to protrude from the chest when the sternum was reflected, and before I could proceed to examine the thorax it was necessary to puncture the lungs in several places, and sponge away the fluid. The heart was considerably enlarged, and the pericardium adhered to it almost universally, by means of a thick layer of coagulable lymph. Where they had been a little disunited, the surface of the heart had a granulated appearance.

Dr. Prost has given an instance of this adhesion. The pulsations of the heart were irregular and diffused; but there was no swelling of the extremities.

Dissection. There was some effusion into the head; the substance of the brain was soft and watery; the pericardium was completely adherent to the heart, and identified with it. At the lower part there existed an osseous lamina about two inches in diameter. The heart was considerably enlarged; and the liver and spleen exceeded their ordinary bulk.—*Med. Chir. J. Mar.* 1818.

In a case of carditis recorded by Dr. Duncan, jun. the pericardium adhered firmly to the heart. It was greatly thickened, and consisted of three laminæ—the middle, white and opaque—the outer, unequal in thickness—the inner, vascular, red, and pulpy. The heart was greatly enlarged, and covered with coagulable lymph. With other affections, this attack had been preceded by rheumatism.—*Ed. Med. J. Jan.* 1816.

Corvisart states, from the concurrence of a great number of facts, that the adhesion may take place in three ways. First, from the interposition of lymphatic exudation. Secondly, where the adhesion is intimate and immediate, complete or partial, without a uniting medium. Thirdly, by numerous cellular filaments. In the last, and sometimes in the second, the patient is placed in a state of supportable inconvenience; but he conceives that death must inevitably ensue, sooner or later, when the adhesion is complete.—*Ed.*

Lancisi found a large abscess occupying the base of the pericardium, and situated between its coats, which, on being opened, discharged a liquor of a melliceroid consistence. The man had laboured under palpitation of the heart, with oppressed respiration; and these symptoms were attributed to aneurism.

Tumours have also been found in this membrane. In one case it was the seat of a tumour equal to the size of a small egg, and full of coagulated blood.*—*Morgagni*, xxiii. 19.

Worms and air in the pericardium.

In the course of my dissections I have never found either worms or air in the pericardium; but such cases are on record. However, I require more certain evidence of their existence, especially in relation to worms, than the testimony of the authors who have related such occurrences. Certainly I would not deny the possibility of a worm existing within the pericardium, as I have often found them within the coats of the aorta of dogs. The existence of air within the pericardium is more credible,

* Dr. Baillie has described tumours of a scrofulous nature in the pericardium; and my friend Mr. Callaway has favoured me with an instance of fungoid disease. In a note to me he says, "I find the disease was of the fungoid class, and attacking the "pleuritic coverings of the heart only; but more particularly, the "investing membrane of the pericardium. The disease had first "attacked the pancreas, which presented one mass of that "medullary substance to which the term fungus hæmatodes has "been given. The tubercles found in the substance of the lungs "presented a similar appearance. The viscera were generally healthy."—*Ed.*

because I have found other cavities, and also the blood-vessels, turgid with it. But I must say of flatus, as well as of worms, that they are more troublesome to the heart by pervading the stomach and intestines, than by occupying the pericardium. Those viscera are often so distended with gas as greatly to interfere with the descent of the diaphragm.*—*Morgagni*, xxiii. 16.

Ossification of the heart and its valves; valves dilated —excrescences and other diseases on them; conversion into cartilage.

Case 1.

Ossification of the heart.

A beggar fifty years of age, who had previously been a wool-comber, became greatly emaciated, and had a hot skin, though the season was extremely cold, it being then near the end of January. At length he was found dead in his cabin.

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* Some French authors have so fully believed that worms have existed in the heart and pericardium that they have given them the specific name of *cardiaire*. These cases, however, are by no means well authenticated, and probably a peculiar configuration of portions of coagulable lymph has led to deception on this point.

The pericardium has sometimes been dilated to a great degree by pus, in consequence of inflammation of the pericardium, or when the pleuritic coverings of the heart have been the seat of inflammation. Morgagni does not appear to have distinguished inflammation of the muscular tissue of the heart. Although it is evidently marked by its consequences, perhaps it seldom or never exists without the membranes being affected. Many instances of serous effusion have already been related, when treating on peripneumony, and others will be adduced with cases of hydrothorax.

Dissection. There was somewhat more fluid in the cavity of the abdomen than is natural; the stomach was greatly distended, and the omentum was drawn upwards. The mesenteric glands were enlarged, and somewhat indurated. The heart was not small but flaccid, and in the middle of its posterior surface there was a bony scale upon it of no inconsiderable extent; and a smaller scale was situated upon the right auricle. These osseous squamæ adhered so closely to the fleshy fibres that they could not be separated without lacerating them. The internal surface of the aorta, near the valves, exhibited some distinct whitish spots; some of which were also observed near the bifurcation of the aorta, and in the iliacs.—*Morgagni*, xxvii. 16.

The heart, as well as the arteries, has been seen by others as well as myself partially ossified.

Columbus, in some bodies, detected the septum ventriculorum converted into cartilage. Veslingius found the interior of the left ventricle surrounded with a cartilaginous incrustation; and in the Sepulchretum a case is recorded, in which a cartilaginous excrescence existed near the left auricle, and even the auricles themselves, had become hard and cartilaginous. Where parts become cartilaginous, there seems no reason to doubt that they may become bony. The fleshy fibres of the heart are sometimes converted into the nature of tendons. Albertini met with some cases in which half the substance of the heart had acquired a tendinous structure and colour; and one instance of this kind came under my own observation. It may be observed that in the advance of life there is

a great tendency in tendinous structures to become bony.—17.

Boerhaave saw the septum of the heart and its cavities bony. In the history of the Royal Academy of Sciences at Paris, A. D. 1726, Garengeot is reported to have found a bone in the heart reaching from one ventricle to the other. The person was seventy-two years of age. Senac not only relates histories of what had occurred in his own practice, but has collected similar instances from others.*—18.

Ossification of the mitral valves has been found to induce violent palpitation of the heart, accompanied with a weak and unequal pulse, in consequence of their contracting the orifice at which they are placed, and from their not being adequate to prevent the return of some of the blood which had been admitted into the ventricle. Hence the circulation through the lungs was impeded, and the right cavities of the heart became dilated. The celebrated Reimannus having observed these symptoms, found one of the mitral valves rough and entirely ossified, as well as its chordæ tendiniæ and the carneæ columnæ.

Morand found one of these valves dilated into a sac large enough to admit a man's thumb. The man in whom it occurred had been subject to palpitation

* Mr. Allan Burns met with a case in which the whole extent of the pericardium covering the ventricles, and the ventricles themselves, except about a cubic inch at the apex of the heart, were ossified and firm as the skull. And Mr. Charles Bell has, in his collection, specimens of a similar change of structure, though not to so great an extent. See a case by Dr. Prost, p. 355. *Ed.*

of the heart. The parietes of the sac were much thickened, and, in places, they were ossified.

Haller, after hereditary palpitation of the heart, found the valvulæ mitrales universally ossified; and the coats of the neighbouring pulmonary sinus were also converted into bone, and part of the heart itself had nearly undergone this change. The pericardium was scirrhous in some places, and adherent to the heart.—xxiii. 12.

Cases, however, occurred to Valsalva, and to other anatomists, in which, although the mitral valves were ossified or rigid, and unequal to their office, the patients, when living, did not complain of palpitation of the heart.

Fantonus found the mitral valves unusually hard and thick. On one of them there were two follicles, and on the other, one; each nearly as large as a vetch, from which, when opened, a yellowish and greenish matter escaped. The old man in whom it occurred had not had any symptoms of affection of the heart: he had only complained of slow fever, and debility of the stomach.

An instance of a grey excrescence growing upon one of these valves occurred to me; yet there had neither been palpitation of the heart nor inequality of the pulse. Cases of induration and ossification of the valves have fallen under my observation, but they will be recorded in other places, on account of the diseases with which they were associated.—13.

A case of contraction of the valves at the origin of the pulmonary artery has been recited.

The pulmonary artery itself has been found ossified.*—14.

Ulceration of the heart.

The governor of the city fortress was frequently attacked with pain in the region of the heart, and syncope ensued. He was under the cautious and assiduous management of Malpighi, and appeared likely to recover, when he was seized with acute fever, and died.

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* Rigidity and ossification in the valvular structures of the heart so frequently occur that it would be superfluous to multiply instances. I have a specimen in which the left auriculo-ventricular aperture was surrounded by a rim of calcarious matter equal in thickness to the little finger. The heart had long been the seat of acute and pricking pain. The diverse indurations which take place in these parts do not appear to be different stages of one morbid process, but are quite distinct from each other. Corvisart says on this subject, "the cartilaginous does not "succeed the mucous or muscilaginous state; and osseous solidity "does not gradually supersede cartilaginous firmness, but a "deposite of osseous matter takes place quite independent of "an anterior cartilaginous state." "Most authors" he adds "have spoken of the ossification of the sero-fibrous parts of the "heart, and have given to the effects of this alteration the "denomination of *stony*; perhaps this is the most correct term "for these concretions." Of these concretions Mr. Hodgson has given an analysis with which he was favoured by Mr. Brand. They consisted of

Phosphate of lime.....	65.5
Animal matter.....	34.5
	100

The animal matter was chiefly albumen with a trace of gelatine.—*Ed.*

Dissection. The heart was found ulcerated, and contained a polypous concretion.

Morgagni, xxv. 17.

Many cases of ulceration of the heart have been witnessed by different anatomists, some of whom have not clearly described the symptoms. In some of the cases of ulceration of this viscus, mentioned in the Sepulchretum, there was intermission of the pulse but no deliquia; in others deliquia and no intermission.—20.

The heart has been found in different states of ulceration. Olaus Borrichius found it deeply ulcerated, and the ulcer in a sloughing state: but he does not mention either syncope or intermission of the pulse. Peter Marchetti has related a case in which an ulcer penetrated to the left ventricle; the symptoms which he mentions as having existed were, emaciation, debility, and fever. From numerous instances recorded by Senac, in the chapter on inflammations, abscesses, and ulcers of the heart, it appears that inequality of the pulse is not a necessary consequence of ulceration of the heart; but, in those cases, frequent deliquia are said to have occurred.

In the cases which have occurred to Valsalva and me, the erosions were small, but they could be clearly distinguished from those concretions which by their inequality and colour resemble ulceration. In them there was neither intermission of the pulse nor syncope; but in cases observed by Albertini there were slight deliquia.—21, 24.

In a case in which a tubercle had formed upon the heart of an old man, neither intermission of the

pulse, syncope, palpitation, nor any other indication of disease in the heart, preceded death; and though I do not think, with Harvey, that the heart is insensible, yet its parietes may sometimes be affected with diseases which, by extension, perforate the cavities, and life is lost without any premonitory symptoms.—25.

Prolapsus of the heart.

The heart may be displaced by a variety of causes, but to some of the reported cases I have objected. In the true prolapsus of the heart the diaphragm is sometimes so greatly depressed that it seems to embrace the heart in a kind of hood, as was observed in the Marquis de Palais by the physician of the French king. As the diaphragm and heart descend, the inconveniences arising from a compressed stomach, and the pulsations of the heart in the left hypochondrium are more or less observed. Therefore not only the patient, but the physician who does not attentively consider all the symptoms, may mistake a displacement of the heart, and its pulsations, for an affection of the stomach and the pulsations of the cœliac artery. It frequently happens from similar compression of the diaphragm, that they who are affected with hydrops pericardii complain of pain and a sensation of oppressive weight in the region of the stomach.*—*Morgagni*, xvii. 28.

* In some cases of malformation the heart has been found either wholly on the right side or verging towards it. It is often displaced by accumulations of pus or of serum in the left cavity of the chest. Recently, when examining a case of hydrothorax,

Polypus of the heart.

Concretions found in the heart have been compared by different anatomists to marrow, fat, and sometimes to flesh; and their appearance bears an accurate resemblance to these substances. But those who imagined that they really were of this nature were satisfied with a very superficial examination of them, and were consequently deceived. Those, however, who were not under a deception, and who really saw that blood-vessels had extended into these substances, a circumstance which I have never seen, did not then meet with the polypi of which I now speak, but with excrescences of the heart. The principal and peculiar substance of these polypi is the same as the crust which often

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in which, although there was an abundance of fluid in both cavities, the larger quantity was on the left side, and the heart was compressed into a narrow space immediately beneath the sternum.

A few years ago I visited a man in whom there was reason to believe the heart had been suddenly and violently displaced; but as the body was not examined after death the case must be related with diffidence. He was an old man and had long been subject to troublesome cough; and, upon one occasion, when coughing with extreme violence, he said that he felt something "crack" within him. He pointed to the region of the heart, and, on examination, no pulsation could be observed in the left side, but it was felt *in epigastrio.* Some months had elapsed when I saw him. On the most attentive examination I could not detect the least impulse against the ribs, but in the epigastric region, the action was very strong, distinct, and circumscribed; and in consequence of the man being exceedingly emaciated, something which in figure and solidity resembled the heart could be traced. The man lived at a distant part of the country, and I saw him only once; but the circumstances appeared to me to indicate a displacement of the heart.—*Ed.*

forms on the surface of coagulated blood. These concretions, however, are sometimes begun and even completed in the living body. I believe that they may commence in cases of protracted syncope; and in those aneurisms which resemble an appended sac, they are perfected.—*Morgagni*, xxiv. 30.

Though in the following case it is not satisfactorily proved that the blood had coagulated during life, it may be worthy of record.—*Ed.*

John Anthony Stancari, whilst examining the body of a woman, found the vena cava and emulgent veins dilated; the coats were partly cartilaginous and in other places bony; and they, as well as the iliac and other veins, were nearly filled with a hard and polypous substance.

It was ascertained that previous to death her body had been universally tumid, and of that livid hue which the skin usually exhibits when a great number of the subjacent veins are turgid with blood. It was also reported that her respiration had been extremely difficult, and the pulse excessively feeble.*—*Morgagni*, lxiv. 9.

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* Concretions in the heart often present so strikingly the appearances of organized substances, that considerable circumspection is requisite before they should be reported as such. If, however, the surface from which they are removed is smooth, it may pretty safely be inferred that they formed after death; or, at least, that they are not organized structures.

Mr. James Stewart has published a case of enlargement of the heart, with polypi. The pericardium was prominent, and contained fifteen ounces of serum, and two ounces of coagulated blood. The blood had been extravasated by some small vessels on the surface of the heart, all of which were enlarged and turgid. The heart weighed 2½lb. Around the root of the aorta, blood had

Aneurisms of the heart.

Internal aneurisms of the thorax, not only compress the lungs in consequence of their bulk, and retard the circulation of blood through them, but they often oppress the diaphragm by their weight; so that, in various ways, they prove injurious to respiration. The most frequent affections of this nature are dilatations of the heart and of the aorta.

These diseases, of course, were not discovered till anatomy was pursued by the dissection of human bodies. Yet the doctrine of dilatation of the aorta made so slow a progress, that in the year 1595, when Sylvatica published his Treatise on Aneurism, he did not mention them; and, many years afterwards, Riolanus asserted that aneurism

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been extravasated into the cellular substance, to the extent of about half an inch, and a small surface over the left ventricle betrayed marks of superficial inflammation. The carneæ columnæ were enlarged; the right auricle, and both ventricles, contained each a large polypus, attached by three or four pedicles. That in the right auricle weighed upwards of an ounce; and each of the others, an ounce. They were of a pale red colour, solid and firm; and when cut into were observed to be highly vascular. *Ed. Med. and Surg. Journal, April* 1817.

Corvisart entertains the opinion that polypous concretions might form previous to death. He divides the concretions into three kinds. *First*—Those which are of longer or shorter standing, which may be known by their pale fleshy colour, their density, their fibrous or fibrinous organization, and the force by which they adhere to some parts of the cavities of the heart. *Secondly*—The polypus-like concretions formed in the latter days of life—of a yellow lymphatic colour; feebly adherent. *Thirdly*—A kind of *magma* or coagulum like badly prepared currant jelly. He admits, however, that there may rather be different degrees of the same thing, than distinct species.—*Ed.*

happened but seldom in the trunk of the aorta, in consequence of the thickness of its parietes. From the year 1670 they ceased to be considered as rare occurrences; and we have now acquired such familiarity with the disease, from the consideration of its causes and symptoms, that we believe it may be distinguished even when very small, and entirely concealed within the thorax. Malpighi, with whom I was partly contemporary, was warranted in accounting the knowledge of dilatation of the aorta amongst the improvements of his age.*

Morgagni, xvii. 1, 4.

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* An improved state of pathological discrimination has led morbid anatomists to distinguish the dilatations of the heart into *active* and *passive*. Some of Morgagni's cases possess characteristic marks of one or the other of these conditions, but in reference to the greater part of them I thought it best to leave this point undetermined. Indeed it will not only be found that some obscurity hangs over cases written antecedent to the nicer discriminations of advancing science, but instances still arise, in which neither the symptoms, nor the appearances after death, so precisely define the quality of the dilatation, that no hesitation shall be felt in deciding to which species they appertain. In the *active* dilatation Corvisart observes, that the heart is dilated, its parietes are thickened, and the force of its action is increased; and in the *passive* form there is evident dilatation, but with diminished thickness of the parietes, and a diminution in the force of action of the organ.

The former of these species of aneurismal dilatation he believes may be occasioned by a disproportionate narrowness of the caliber of the vessels, so that the muscular fibres of the heart will be required to drive forwards too great a column of blood through the narrow channels. The vessels being inadequate to admit this quantity, cannot, at first, sufficiently dilate themselves. They will therefore oppose the progression of the fluid, which will necessarily react upon the agent which impels it.

Case 1.

Aneurism of the right auricle; a vesicle on the kidney.

A man sixty years of age, was seized with orthopnœa; and such was the degree of oppression

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" The first effect of this reaction" he says " will be to cause the " extension—the elongation of the fibres of the heart; the second " to prolong the stay of the blood in the cavities of that organ, " and consequently also to prolong the stay of its stimulus. " Finally, the coronary arteries, as well as the capillaries of the " heart, remaining in a permanent state of fulness, will supply " more nourishing matter to the fleshy substance of this organ, " whence arise, without doubt, the increase, at least in part, of " its vital energy, and also the dilatation of its cavities; the " elongation of its fibres, the thickening of their bands, the " greater consistence of the parietes, and the more vigorous " action of the organ.

" The same causes, acting daily and hourly, will tend more " and more to change the natural state of the heart, as well as " that of the arteries which spring from it. These latter will yield " with less facility, the dilating power acting less directly upon " their parietes, which, moreover, can oppose a greater relative " resistance, by reason of their own organization, and the support " which they derive from the pressure and action of the sur- " rounding parts. The heart on the contrary, free on all sides, " formed of fibres, susceptible of great extension, and supported " only by their own reciprocal union, will experience in its " organization, a change which the same efforts will not produce " upon the arteries. It is true, we sometimes see these vessels " yield to the efforts of the blood propelled forward by the heart, " which, itself, in some subjects, preserves its natural size, while " the arch of the aorta, for example, undergoes a great dilatation; " but, then, a peculiar and local weakness favours the dilatation " of the vessel which becomes the seat of aneurism.

" The formation of aneurism of the first species, does not " always depend upon the want of proportion between the caliber " of the vessels, and the quantity of blood which the heart has " to send through them. Every obstacle to the current of the

at the chest, that he had scarcely power to express his sufferings: but the pulse did not

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" blood, whether it arises from faulty organization, from a patho-
" logical state, from the influence of moral causes on the action
" of the heart, from motions of the body, perhaps also from the
" more or less stimulating quality of the blood, must be con-
" sidered among the causes of these aneurisms since the effects
" which they produce, and the derangements which they occasion
" in the circulation, appear to be the same in their conse-
" quences."

In the aneurisms of this species the heart appears to become the centre of more active nutrition and circulation, but in those of the passive form this organ distends itself in the same manner as the bladder in cases of retention of urine. " The blood " which ought to pass from the auricle into the corresponding " ventricle, finding an obstruction at the aperture of this latter " cavity, or in some more distant point of the circulation, lingers " and accumulates in the auricle, the parietes of which it insen-" sibly dilates. This dilatation causes them to become thinner, " and to lose their spring and contractibility. These various " changes finally dispose them to rupture, which would indeed, " be the necessary termination of this disease, if the derangement " which it produces in the circulation, and the functions depen-" dant upon it, did not cause death before there had been suffi-" cient time to allow the dilatation to reach the point which " would render the rupture of its coats inevitable; an accident " not without example."

" A natural debility, a deficient excitability, a serous diathesis, " blood deficient in its stimulating properties, appear to me to " be perhaps necessary to give rise to, and certainly to favour " the action of the causes of passive dilatation."

Corvisart has divided the general signs of aneurism of the heart into three stages; and the following is an abstract of the principal phenomena which he has recounted.

First stage. The countenance is scarcely altered, but frequently it presents transient flushings; and the patient is easily fatigued. The sound is equally good in all the regions of the thoracic cavity, but there is often a painful sensation about the heart. The patient experiences frequent numbness and dazzlings;

deviate from its natural action. At the expiration of some time the difficulty of respiration daily

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and he feels as if hot vapours were mounting from the chest to the head; and is gloomy, impatient and irascible. Palpitations, more or less frequent, are found to occur. There is considerable irregularity and variableness in the pulse, though much less than in the other stages of the disease. The respiration is high, short, and difficult; the least exertion causes an oppressive breathlessness; and the patient is liable to symptomatic catarrhal complaints. The digestive faculties appear to have an unnatural degree of activity; and the bowels are usually constipated. The secretions are not much disturbed, but the urine deposites a red and bricky kind of sediment.

Second stage. The face is bloated, the cheeks and lips are of a deep red, approaching to violet; the general bulk of the patient is somewhat reduced, and the feet and legs during the day become œdematous. The region of the heart does not give a clear sound on percussion. The numbness more frequently recurs, and is sometimes followed by fainting. There is a sense of violent constriction about the throat, and the moment the patient endeavours to sleep he becomes faint. He is often awaked also by frightful dreams. The palpitations are now stronger and more frequent; and are sometimes felt to a considerable extent; and this circumstance occasions many to suppose that the pulsations are in the cœliac artery, which can only be felt on extraordinary occasions. The pulse in *active* aneurism is hard, vibrating, frequent, and sometimes contracted. In *passive* aneurism, on the contrary, it is soft, tolerably frequent, feeble, and easily suppressed. In both cases it is sometimes irregular, but this usually arises from co-existent lesions. The respiration is extremely difficult. The patient makes long inspirations, which he is obliged incessantly to repeat, because the gorged and compressed lungs can admit but little air. He cannot breathe in the horizontal position, but is obliged to sit up bending his body forwards, and supporting, as it were, his chest upon his knees. He cannot ascend three or four steps in close succession, without being obliged suddenly to stop in consequence of an extreme shortness of breath. He has a troublesome cough, and often, bloody expectorations. The digestive powers are impaired and

grew more distressing, and he died on the sixth day.

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the bowels relaxed. The urine at intervals is scanty, and serous effusion shows itself in the extremities; and approaching ascites and anasarca are announced.

Third stage. The face is more bloated, more œdematous, and especially more suffused than before. The lips and cheeks, as well as the nose, are bluish, violet, and livid. The extremities are cold, and the integuments of the body anasarcous. There is constant anxiety of mind, so as frequently to produce furious despair; and sometimes the patient is delirious. The pulsations of the heart are on some occasions scarcely perceptible; but a deep indescribable tumult, or a diffused rustling, is felt on applying the hand. The pulse, in almost all cases, is small, frequent, unequal, intermittent, scarcely perceptible, and often vermicular. The sense of suffocation is every moment more threatening. There is a convulsive-like cough; and often bloody sputum is expectorated, or a mucus, which from the state of the mucous membrane of the bronchia, resembles pus. The digestive powers seem to be nearly annihilated. The urine is thick and scanty, and deposites a sediment; and the serous diathesis is often at the highest pitch.

When the disease goes through all its stages, death is sometimes slow, and the patient expires insensibly; on the contrary, when the patient dies in the second stage, death is almost uniformly sudden and unexpected.

The distinguishing marks of the *active* species are, a sanguineous temperament, a robust constitution, vigour of life, a red countenance, suffused eyes, a strong, hard, and vibrating pulse; and it is often the consequence of an acute lesion, or one excited by immoderate and long continued exertion. The *passive* species is indicated by a lymphatic temperament, a feeble constitution, a countenance pale and wan, though sometimes bloated and violent. The palpitations are weak and sometimes slower and duller, the pulse is weak, more or less frequent, and often not very perceptible. The serous diathesis usually prevails; and the disease frequently arises at the close of chronic affections.—*Ed.*

Corvisart on the Heart.

Dissection. The posterior part of the lungs was somewhat indurated, and of a black colour. The heart was exceedingly large, in consequence of the right auricle being dilated, so as to resemble a large purse; and this cavity was filled with a firm concretion of blood.

At the upper part of the left kidney there existed a round tumour, having in its centre two distinct sinuses containing serum, which coagulated by heat.—*Valsalva*, xvii. 8.

Case 2.

Aneurism of the right auricle, with serous effusion into the abdomen, thorax, and pericardium.

A girl thirteen years of age, who from birth had been almost uniformly a valetudinarian, began to complain of laborious respiration, accompanied with cough, copious expectoration of thick matter, and intumescence of the abdomen. This was about six months before her decease; and during the latter few days of her life both thirst and hunger were greatly augmented. Her pulse was quick, hard, and small. The sense of constriction and oppression at the chest was occasionally so urgent, that she rose suddenly from her bed, sighing and groaning; and, at length, she expired in one of these paroxysms.

Dissection. A large quantity of a yellow serum was effused into the abdominal cavity. The stomach and intestines were greatly inflated with gas. The spleen was very hard, and of a black colour.

The thorax was inundated with serum, so that it burst forth as soon as the cartilages of the ribs were divided. There was a large thymus gland. The

substance of the left lung, adjacent to the larger bronchial tubes, resembled the texture of solid flesh. The pericardium contained four or five ounces of a yellowish serum, and the right auricle, which was filled with coagulated blood, was almost equal to the usual magnitude of the heart.

When the serum of the abdomen and pericardium was evaporated by heat, the residue was merely a thin crust, which adhered to the vessel; and the residuum, after the evaporation of the thoracic fluid, was a thinner pellicle, but it exhibited some striæ resembling the crystals of nitre.—*Valsalva*, xvii. 10.

Case 3.

Aneurism of the right auricle, with serous effusion in the head, and abdominal disease.

A young man twenty-eight years of age, who was tall and fat, and naturally of a florid complexion, was liable to frequent attacks of pain in the stomach; and in consequence of occasional weakness, exertion was sometimes difficult, and he respired anxiously. Twice he fainted to so violent a degree as to appear dead; and he often complained of headach and vertigo. Though preserving a ruddy complexion he lost flesh; and one evening, having returned home fatigued, and annoyed with his usual gastric pain, he anointed the epigastric region with petrolium, went to bed, and passed a tranquil night. The next morning he reported himself well. He rose at an early hour to evacuate his bowels, and as he returned to bed his wife observed that he was scarcely able to raise his feet, and that he then staggered and almost

fainted. He threw himself down in bed, and exclaimed that he was exceedingly ill. His face was very red at first, but it grew pallid; he manifested a slight inclination to vomit; the alvine and urinary excretions passed from him involuntarily; and he died within a short time.

Dissection. The face and neck of the body were tumid, and of a livid hue. About six hours having intervened between the time of taking supper and the hour of decease, the lacteals were seen running through the mesentery. The spleen was enlarged to twice its natural size, and the coats of the stomach, contiguous to the spleen, were so attenuated as not to be half so thick as in other parts; and internally they exhibited numerous bloody points. The cavity of the stomach contained some yellowish matter.

The right auricle of the heart was dilated, so as to equal the third part of the whole organ; and the right ventricle contained a large quantity of fluid blood, with a small and compact concretion of a flesh colour.

On examining the head, about two ounces of serum flowed from beneath the dura mater when it was divided, and there was a moderate redundance of fluid in the ventricles.—*Valsalva*, xxv. 2.

Although this case relates to diseases of the stomach and head as well as the heart, it is placed here because the syncope indicated, that however the head and nerves might be implicated, the state of the heart was the immediate cause of death. When the cavities of the heart are enlarged, fainting is not an unusual occurrence. Amongst

other instances I have elsewhere cited one related by Grassius, concerning a young woman who was liable to frequent recurrences of lipothymia, and who died suddenly, of an attack which was supposed to be apoplexy. On examination, however, no evidence of disease was detected, except in the right auricle of the heart, which was of twice its natural capaciousness.

In the preceding case there cannot be a doubt that the functions of the heart were deranged in consequence of the diseased stomach, and also from the deposition of fluid in the head, through the medium of the nervous system. Blood having accumulated in the right cavities of the heart, occasioned turgescence of the vena cava, and affected its nearest branches, the jugulars, in a similar manner; and to this cause must be attributed the tumefaction and lividness of the neck, of the sides of the pharynx, and of the face.—*Morgagni*, 3.

Case 4.

Active aneurism of the right auricle and ventricle; the foramen ovale open, and excrescences on the pulmonic valves.

A girl who from birth had experienced great debility, and difficulty of respiration, and the surface of whose body was of a livid tint, died at the age of sixteen.

Dissection. The heart was small, and the relative state of the ventricles was reversed; for the right had the usual form of the left, and the left that which usually belongs to the opposite cavity. The capacity of the right auricle was twice that of

the left; and its parietes were doubly fleshy. The foramen ovale was sufficiently open to admit the little finger. Two of the tricusped valves were smaller than usual. The semilunar valves, at the origin of the pulmonary artery, were slightly ossified, and so united together that only a small foramen, sufficient to admit a lentil, was left between them; and at this foramen, small and fleshy membraneous productions existed, and were so placed as to act as valves, yielding to the blood as it proceeded from the heart, and resisting its return.—*Valsalva*, xvii. 12.

It is probable that the preternatural appearance in the mouth of the pulmonary artery originated in malformation; and to the gradual increase of obstruction from that cause, all that the girl suffered might be attributed.*—*Morgagni*, xvii. 13.

Case 5.

Dilatation of the right auricle and ventricle, from contraction of the aorta.

The man who was the subject of this case was often annoyed with attacks resembling incubus, and with difficulty of respiration; and to these affections slight fever was added. After the loss of blood he appeared convalescent; nevertheless the disease recurred, his face and neck acquired a livid complexion, and he died.

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* The pulmonary sigmoid valves are much less frequently diseased than the aortic. Corvisart had found them slightly indurated; but in reference to the above case of agglutination, so as scarcely to leave an opening between them, he says, Morgagni is the only author who has observed this pathological state.—*Ed.*

Dissection. Some water was found in the thorax, and the heart had acquired an almost unprecedented magnitude. This augmentation of bulk principally arose from dilatation of the right auricle and ventricle. Near the heart the aorta was contracted to an astonishing degree.*

Morgagni, xviii. 6.

In some instances where the right auricle and ventricle have been dilated, and the orifice between them has been enlarged, an impulse has been given to the blood in the venæ cavæ, and the jugular and brachial veins have pulsated; and the former have been dilated. Lancisi proposed this venous pulsation as a diagnostic sign of dilatation in the right cavities of the heart; but it sometimes arises where

* Dr. Palloni has recorded an instance of passive dilatation of the right auricle, in consequence of which the heart had acquired double its usual size. It appeared to have originated in a contraction of the coats of the aorta, and was complicated with general visceral disease.—*Med. Chir. Journal, Sept.* 1816.

In the same Journal, February 1817, another case of passive aneurism of the right cavities is related. The man, who was a debauched character, had oppression of the chest, cough, and fetid expectoration. The paroxysms were aggravated, and, at length, he experienced *decubitus difficilis* on the right side and back. The pulsations of the heart were tumultuous and weak. The lungs were filled with yellow serum, and covered with a membrane of lymph. The heart was double its natural size; and the right auricle was very large and filled with coagulated blood. Its parietes were extenuated, the auriculo-ventricular opening was preternaturally large, the right ventricle was expanded, and its parietes were thin.

The reporter adds "the feeble strokes of the heart indicated "passive aneurism in this case; and the tumultuous movement "under the sternum, indicated also that the dilatation was seated "in the right cavities of the heart."—*Ed.*

no such enlargement had taken place. If, for instance, either of the tricusped valves becomes contracted or inflexible, it will consequently be incapacitated to perform its functions; or if any of the chordæ tendiniæ are ulcerated, ruptured, or relaxed, and thus rendered inadequate to retain the valve in its situation, so as to close the orifice, some blood will return into the veins when the ventricle contracts. Certainly this symptom often indicates dilatation in the right cavities of the heart; but occasionally it denotes some other affection which either exists in those cavities, or, at least, maintains such a relation to them as to interfere with the transmission of blood through the right side of this organ.—9, 10.

We must be careful not to be deceived by a kind of alternate turgescence of the veins, which corresponds with a deep inspiration, or a forcible expiration. It will be easy to distinguish, however, whether the dilatation concurs with the frequency of respiration or of pulsation. We must likewise be careful not to confound the pulsation of veins with that of dilated carotid arteries; and provided the vessels are prominent and tumid we shall experience no difficulty if we attend to the situation, and to the softness of the parietes if it is a vein. We shall be assisted in the distinction by compressing the vessel; for should it be a vein, it will become turgid above the obstructed part, and will subside below it. We must also observe whether there may exist any other cause which does not involve organic disease in the heart, as is the case with chlorotic females, in whom, especially when

ascending steep places, Lancisi believed that this pulsation sometimes occurred. If, however, other signs of an affection of the heart are present, such as palpitation, oppression in the region of the heart, syncope, with a pulse generally full and equal—a dilatation of the right cavities may be inferred. Perhaps it may be justly said, however, that the pulse is the most equivocal symptom, as it is often rendered unequal from complication with disease in the left side of the heart.—11.

In all the cases alluded to, the pulsation in the jugular veins must be ascribed to the contraction of the ventricle, and not to that of the auricle. In some of them the auricle was callous; and in a case by Dionis that sinus was covered with an osseous scaly substance, like a very hard egg-shell. It may sometimes, however, arise from the auricle; and I believe it is possible to distinguish from which of these cavities it really happens. If the eye is fixed upon the veins at the time of applying the fingers to the artery, and the pulsations are found to be synchronous, it may be inferred that the impulse is derived from the ventricle; but if they are not synchronous the conclusion will be, that the pulsation of the veins is occasioned by the contraction of the right auricle.*—12.

* In consequence of the frequency of complication, there are no symptoms which unequivocally distinguish an aneurism of one cavity from that of another. The sign proposed by Lancisi as characteristic of dilatation in the right side of the heart, has been observed in persons in whom the left cavities were found dilated. At the same time Corvisart thinks that when united with other circumstances, this venous pulsation, may enable us to form a pretty correct notion as to the side of the heart which

It sometimes happens that a dilatation takes place in cavities on opposite sides of the heart,

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is affected. The circumstance of the pulsations of the heart being most evident on the right side, he says, may be considered as a sign of the dilatation of the right ventricle; and though the state of the pulse is exceedingly equivocal, yet he appears to suppose that it will be found more frequently regular when the right side of the heart is the seat of aneurismal expansion, than when it exists in the left. But "it is in the organs which are dependent upon the "two circulations," says Corvisart, "that those phenomena are "observed which are best calculated to point out the particular "cavities of the heart which are affected. The lesser circulation, "the pulmonary organ itself, seems to be more particularly "affected in the aneurism of the right ventricle, the breathless-"ness is in general greater, and the fainting also more frequent. "The countenance is violet and almost black, in consequence of "the prolonged stay of the blood in the vena cava superior, the "jugular and the facial veins, which cannot easily disgorge "themselves into the right auricle."

"On the contrary, in aneurisms of the left cavities the disease "appears better marked in those phenomena which are under the "influence of the greater circulation. In these affections the face "is suffused, of a very lively and deep red, particularly the cheeks, "while in aneurisms of the right cavities, it appears as though "ecchymosed." At the close of the second stage, when, in both species, the general bloatedness comes on, it is more slow where the left cavities are affected, because the pulmonary fulness which always exists, does not allow the blood in the lungs to be properly and fully submitted to the repairing influence of respiration.

Dr. Pearson has published an interesting case of dilatation of the right auricle and ventricle, in which also some of the carneæ columnæ attached to the tricusped valves were thickened and shortened, by which the passage of blood into the pulmonary artery must have been considerably obstructed. On the left side too, the valves were greatly diseased; the mitral were partly cartilaginous, or, at least, thickened; and there was a still greater obstruction to the transmission of blood into the aorta, from the indurated state of the semilunar valves. The liver was large and pale.

and of this circumstance the following case affords an example. It was communicated to me by that distinguished man Santorini.

The patient was a female, fifty-three years of age. Her lower limbs were œdematous, and her pulse about eighty. But the most remarkable phenomenon was a pulsation or undulation in the external jugular veins, not corresponding, however, with the pulsations in the temporal or radical arteries. In a recumbent position the pulse of the jugulars was a hundred and twenty or thirty, and at the wrist about sixty. Doctor P. observes that with the exception of a somewhat similar case under the care of Dr. Young, he could not find that such an occurrence had been observed in St. George's hospital for thirty years; and infers from its rarity that no common obstruction can occasion this repulsion of venous blood. In this instance, indeed, as there was a similar morbid state of both sides of the heart, there was a double regurgitation of blood, namely into the pulmonary veins, and into the venæ cavæ manifested by the pulsation in the jugulars.—*Ed. Med. and Surg. Journal, April* 1816.

Dr. Carbutt has related the case of a woman forty-two years of age, who complained of pain and uneasiness about the heart; numbness in the left arm and hand; and the pain and uneasiness were increased by walking up hill or against the wind. The heart beat through an extended surface; the pulse was rapid, weak, irregular, and scarcely perceptible at the wrist; an undulating pulsation was observed in the course of the right internal jugular vein; and the right external jugular was distended. The respirations were thirty in a minute, laborious and performed by the ribs. There was slight hemoptöe—the countenance was puffy and pale—the lips blue. As the disease advanced the right arm became benumbed like the left.

Dissection. The heart was twice its usual size, the inferior cava was greatly enlarged, and the superior less so. One of the tricusped valves was remarkably tied down, so as to perform its office very imperfectly. The pulmonary veins were much distended. The right auricle was enlarged, but the left was natural. The aortic valves were inadequate to close the artery, in consequence of one being nearly obliterated.—*Ed.*

Case 6.

Aneurism of the left ventricle, and of the right auricle.

A man who had occasionally experienced short paroxysms of dyspnœa, suddenly exclaimed that he was dying, and began to walk quickly across his chamber; but he soon dropped on the bed, and instantly expired.

Dissection. The thorax contained several pints of a bloody serum. The inner surface of the aorta was rugged from osseous laminæ, and there existed some tubercles amongst them. The left ventricle of the heart, and also the right auricle were dilated.

Morgagni, xviii. 8.

Case 7.

Aneurism of the right auricle and of both ventricles; the heart flaccid.

A young man whose occupation was that of a cook, and whose habits were those of a wine-bibber, began to experience uneasiness in the chest and stomach, as well as some difficulty of respiration. Soon afterwards a degree of hardness was perceptible at the umbilicus, but these symptoms were uncombined with fever. Having been twice bled, and taken suitable medicine, he thought himself well; but eight days afterwards, from too much exertion in walking, whilst his limbs were feeble, all the symptoms recurred in an aggravated degree. He was brought into the hospital of St. Mary de Morte on the 30th of April 1703, which was either the eighth or ninth day after the relapse, and about a month from the commencement of his

illness. His face was pale and somewhat swollen; his feet and legs were cold and œdematous; he voided but little urine, and suffered considerable thirst. In every position he experienced equal difficulty of decumbence. He chiefly complained of tightness and a sense of weight at the chest. I could perceive no pulsation in either wrist. Every night he had been affected with fever, during which the upper part of his body was hot. He died on the following day.

Dissection. A considerable quantity of blood had issued from the mouth. There was a small redundance of serous fluid in the thorax and abdomen. The heart was one of the largest I had ever seen; the ventricles and the right auricle were greatly dilated, and full of black and almost fluid blood; the coronary arteries were large, and also in a state of sanguineous plethora. The fibres of the heart were extremely flabby.

The small intestines in the umbilical region, to the extent of a hand's breadth, were inflamed; the liver and spleen were indurated, and the latter was closely united to the diaphragm. The source of the blood which dribbled from the mouth, was not ascertained.—*Morgagni*, xxi. 49.

Case 8.

Aneurism of the left auricle of the heart.

A man about fifty-five years of age, of an athletic body and a pallid countenance, complained of pain in the left side of the thorax, on which side he was unable to lie down. He coughed frequently, but not with violence, and expectorated

a serous sputum. He had difficulty of respiration, with a sense of oppression at the chest, and of anxiety in the region of the heart. The pulse, at first, was slow and hard, as well as full and vibrating; but afterwards, whilst continuing hard, it became more quick and also unequal. The abdomen was tense, but not tumid. He died.

Dissection. The abdomen contained some fluid, and the spleen was so closely united to the liver that they could scarcely be separated without laceration: nevertheless the texture of these viscera and of the others contiguous to them, was perfectly natural. No lacteals were observable through the intestines or mesentery, but numerous distended lymphatics were noticed about the large vessels in the loins.

The thorax contained serous fluid—indeed the left cavity was filled with it. The lungs were of a dark colour throughout, but were diversified with black spots, and yet they retained their natural softness. The heart was of an enormous size, and the right auricle was equal to half its bulk. On puncturing this sinus, blood gushed from it ,having the fluidity of the living state.

Valsalva, xvii. 6.

Case 9.

A countryman eighty years of age died in the hospital, apparently from fever, which came on after repeated diarrhœas. On examining his body the surface of the heart was found to be covered with a great quantity of hard fat. The left auricle was greatly dilated, and the corpora Arantii of the aortic valves were partially ossified; nevertheless, there

had been no peculiarity in the pulse, nor any difficulty of respiration.—*Morgagni*, lxiv. 7.

There are fewer examples extant of dilatation in the left auricle than of the right, therefore I shall cite the following instance which occurred to Schreyus.

CASE 10.

Dilatation of the left auricle.

A boy seven years of age, was affected with palpitation of the heart, with a quick and feeble pulse; and ultimately he died from the disease.

Dissection. The heart was found larger than that of an adult—the capacity of the left auricle being equal to the magnitude of an egg. There was a large quantity of serum in the thorax.

Morgagni, xviii. 15.

CASE 11.

Passive aneurism of the heart; all the cavities dilated.

A shoemaker thirty-three years of age, had for some years experienced difficulty of breathing, even when sitting at his trade. It was accompanied with an occasional though slight tendency to fainting, and his pulse at those times was unequal; nor was he exempt from vertigo. One morning about the middle of January 1739, having ascended all the stairs of the hospital, which are very numerous, he was placed in bed, when he complained of pain in the region of the diaphragm. He was troubled with a cough, and his pulse was languid and somewhat frequent, but neither intermittent nor unequal. The symptoms did not apparently indicate the near approach of death; but he vomited a greenish

matter, and expired within half an hour after coming into the hospital.

Dissection. The appearance of the body was like that of a cachectic person; the skin was a little affected with scabies, but there was no œdema of the feet. A small quantity of bloody serum was deposited in the abdomen. A large portion of the small intestines was found of a reddish brown colour, and the colon to a considerable extent, especially its transverse arch, was so contracted as scarcely to exceed the thickness of a thumb. The stomach, likewise, was contracted, and marked internally with striæ of inflammation, especially on the rugæ; and the upper orifice was livid. This viscus contained a small quantity of yellow bile. The aorta passed through a foramen in the diaphragm, and not under the arch of the crura diaphragmatis as usual; and this vessel, in the abdomen, was uncommonly small. Each thoracic cavity contained a small quantity of limpid serum. The right lung was united to the costal pleura, and both these viscera were turgid, and their texture could not be torn or separated from the bronchial tubes without much greater force than is usually requisite. In attempting to strip off the external coat of the aorta, I also found greater resistance than usual. The bronchial glands, at the bifurcation of the trachea, not only appeared numerous, but were enlarged to the size of small grapes.

The pericardium contained a small quantity of a reddish fluid; and the heart was more than twice its natural bulk. Both the auricles were somewhat

dilated, and the capaciousness of the ventricles, especially of the left, was greatly augmented. The parietes of the left ventricle were so extenuated as scarcely to equal the ordinary thickness of the right. The aortic valves were slender and contracted, and also somewhat rigid and hard. The ramifications of the coronary arteries were loaded with blood. The inner coat of the artery was variegated with large opaque spots, which were the beginning of ossification; and the process had advanced, in the arch of the aorta, where we found the spots more evidently approached the nature of bony laminæ: and though the parietes were nowhere completely ossified, they were hard, and of an intermediate texture between cartilage and ligament.

The vessels in the dura mater, as well as in the pia mater, were distended with blood of a black colour.—*Morgagni*, xviii. 2.

The dilatation of the heart was probably occasioned by the contraction of the aorta, and its preternatural course through the diaphragm, aided by the sedentary life, and the position common to shoemakers; for by these circumstances the circulation of blood through the aorta and its inferior branches must have been impeded.

In some cases, perhaps, there is congenital laxity of the whole heart or of some part of it; and it seems necessary to acknowledge this when, from obstruction in the aorta, the right, and not the left ventricle, is dilated. In general, however, the obstruction and dilatation correspond.—4.

My own observations, and those of others so far

as I have become acquainted with them, lead me to think that aneurism of the left ventricle is more frequent than that of the right; but I have not met with many instances of dilatation of the left auricle. Those of the left ventricle are usually connected with disease in the aorta or its valves; and those of the right ventricle, are generally dependant upon some impediment either in the valves at the orifice of its emissary, or in the transmission of blood either through the lungs or in the aorta. When it originates from the latter circumstance, it would appear either that there must be unusual firmness in the parietes of the left ventricle, or unnatural weakness of those of the right.—5.

The following case was communicated by Mediavia.

Case 12.

Dilatation of all the cavities.

A youth, well formed and of an excellent habit of body, had long experienced difficulty of respiration, from which he obtained temporary relief by occasional epistaxis. After some time this hæmorrhage ceased, and the young man, having undergone a long and fatiguing journey, fell whilst stooping to his portmanteau, and instantly expired.

Dissection. Before opening the body the vessels of the neck and head were observed to be turgid with blood, and the lungs were livid from its accumulation in them. There was a considerable quantity of reddish serum in the pericardium, and the heart appeared even to exceed the magnitude of that of a bullock. The auricles and right ventricle

were certainly augmented, but the chief enlargement pertained to the left ventricle. Its parietes were not thicker than natural, but the cavity was excessively expanded, and filled with black and grumous blood. The semilunar valves were indurated, contracted, and corrugated. The coats of the aorta were extenuated, and its inner surface not entirely exempt from longitudinal furrows, though they were obscure.—*Morgagni*, xxvii. 12.

The dilatation of the other cavities was undoubtedly occasioned by the dilatation of the left ventricle in the way that has been explained; and if this young man had taken the precaution, when the nasal hæmorrhage ceased, to have had blood withdrawn from a vein, at proper times, he would either not have died thus, or, at least, not so soon.—13.

I wonder that the increased magnitude of the heart is not attended to in the histories of asthmatic persons; since it is often found enlarged to a considerable degree, and, unquestionably, is the cause of many of the symptoms. The enlarged heart not merely compresses the lungs, but it obstructs pulmonary circulation, and by these means it renders the breathing difficult. Other cases, besides the preceding, have been related, in which the heart had acquired such an immense size as to equal that organ in the ox. Gerbezius, on opening the body of a monk, found the heart so heavy as to weigh thirty ounces. In some cases of this nature, in addition to the difficulty of breathing, there occured palpitation, frequent deliquia, and ultimately, a sudden death. But in the instance of

that celebrated man Alexander Marchetti, though there was an enlarged heart, and very extraordinary dilatation of the right auricle, there was no affection of respiration, and consequently none of the symptoms referrible to it. This immunity has happened in other cases.—*Morgagni*, xviii. 15.

Case 13.

Aneurism of the heart, complicated with dilatation of the aorta.

A pauper in the sixty-fifth year of his age, and of a sanguineous temperament, had for some years, at intervals, experienced oppression at the chest, with a slow, tense, and vibrating pulse, and a consequent depression of mind and diminution of strength. In December 1687 he was admitted into the hospital of St. Mary de Morte on account of tertian fever. The febrile affection was soon removed, but the oppression of the chest, and palpitation of the heart, were so urgent on the eleventh day, that he appeared to himself and to others to be on the point of death: yet these symptoms continued till the twentieth day with such unmitigated severity, that he was rendered speechless, and almost desperate. About the twenty-seventh day he complained of a sensation of extreme fulness in the chest; but about the thirtieth day there was some remission of the paroxysms, and his pulse became natural. He expectorated a considerable quantity of matter like jelly, commixed with palish red substances. The integuments upon the os sacrum became gangrenous, from his continually lying on the

back, and from the irritation of the excrements. He died on the fortieth day.

Dissection. The thorax was dissected, with the assistance of Hippolyto Francesco Albertini, who then was assistant-physician to this hospital. The lungs were closely adherent to the costal pleura, but this circumstance is very commonly met with in dissection. These viscera were of a black colour, and when cut into they were found to contain a secretion similar to that which had been expectorated, but of a thinner consistence. The pericardium contained nearly a pint and half of a dark-coloured serum, and the heart was nearly equal in magnitude to that of a bullock. The parietes of the right ventricle were greatly thickened, but the cavity was natural. The cavity of the left ventricle, however, was so much expanded, that it might have received within it another heart, but its parietes were so extenuated, that they appeared scarcely adequate to have sustained the action of the heart. The aorta was proportionably dilated, and consequently appeared rather to pertain to the body of an ox than to the human subject: its inner coat had a cartilaginous texture.

Valsalva, xvii. 21.

Intemperance in wine had been the first cause of this man's disease. That experienced physician Lancisi has affirmed, that out of a hundred cases of aneurisms, which arose spontaneously, more than fifty had occurred in gluttons and drunkards. It is probable that the dilatation of the artery had preceded that of the heart; and when the vessel became dilated and its parietes cartilaginous, and

consequently unfit to propel the blood onward, that fluid must have been retarded in its progress; and not only did the ventricle become dilated, but the circulation through the lungs was obstructed. Hence arose the oppression and tightness at the chest, and the increased secretion from the bronchial glands. Turgescence of vessels upon the surface of the heart would account for the dropsy of the pericardium.—*Morgagni*, 22.

Case 14.

Aneurism of the heart and of the aorta; the aorta ossified.

A man fifty years of age, daily occupied as a wool-dresser, complained of difficult respiration, accompanied with wheezing. Sometimes he was attacked with a sense of constriction at the præcordia, and distress in breathing, and these paroxysms were occasionally succeeded by violent pain in the loins. The arteries of the neck pulsated strongly. A few days before death hæmoptysis came on, with extremely disturbed respiration.

Dissection. A quantity of serum, the colour of diluted blood, was effused into both cavities of the thorax. The lower part of the left lung, and one lobe of the right, were black from the extravasation of blood into their substance. The heart was enlarged; and the aorta, near the heart, was dilated into an aneurism, the internal parietes of which were interspersed with osseous squamæ.

The cerebrum was soft, and a serous fluid was effused about it; but the larger quantity was accumulated at the origin of the spinal marrow.

Valsalva, xvii. 23.

The pain in the back, it is probable, was ascribable to the violent action of the diaphragm; as this muscle is attached to the lumbar vertebræ by one of its extreme portions: and the dilatation of the aorta may be imputed to the action of the enlarged heart. The accession of bulk, however, appears not to have arisen exclusively from augmented thickness of the parietes, but, likewise, from some expansion of the ventricular cavities.

Morgagni, 24.

Case 15.

Aneurism of the heart and aorta; the anterior bones of the thorax absorbed.

A woman about sixty years of age, had laboured under occasional cough and difficulty of breathing, especially after violent exertion, for a long period. At length a pulsating tumour arose beneath the sternal extremity of the clavicle, which, within two or three months, increased to such a degree, that another head seemed to have arisen from the middle of the sternum; for it extended from thence, almost in a globular figure, to the neck. There was a sense of heat and burning pain in the tumour. The humeral half of each upper arm remained greatly extenuated, but, from the middle downwards to the hands, an extreme degree of œdematous tumefaction had arisen; and a similar swelling, though in a less degree, pervaded the lower extremities. She had frequent expectoration, and during the latter days of her life the sputum resembled pus. The pulse was weak and small. She was unable to obtain any rest, except when sitting up; for every slight motion, as well as

lying upon the back, immediately brought on symptoms which threatened suffocation. Similar effects were produced by taking food or drink, so that she was compelled to abstain from both; and died after an abstinence of six days.

Dissection. Some limpid fluid was found in the abdominal cavity. The liver and stomach were somewhat lower than usual. The colon did not pass from the right side to the left, but as soon as it touched the fundus of the stomach it descended through the middle of the abdomen to the rectum. There was an accumulation of fæces in the caput coli. A glandular body, as large as a walnut, lay upon the left kidney; and its internal structure was of a yellow colour.

The thorax contained serum. The left lung had collapsed, and appeared as if it had been inflamed. It contained small tubercles, some of which were in a state of suppuration. The pericardium was distended with serum, and the heart was double its natural size. The aorta had a large oblong aneurismal sac produced from it; the orifice of this sac communicated with the artery at the upper part of its curvature, and the common trunk of the right carotid and subclavian arteries having been dilated into the sac, these two vessels arose from its posterior part at the commencement of the expansion. The sac compressed the trachea and œsophagus; and had occasioned the absorption of the anterior bones of the thorax, especially the right clavicle and the contiguous parts of the ribs and sternum; and having raised up the muscles and integuments, it presented externally the

appearance which has been described. The outer coat of the artery, as it receded from the trunk, became so much extenuated that it could scarcely be distinguished where it was exterior to the thorax. The parts which had been carried forwards with the sac, and which surrounded it, would prevent the blood from being easily effused by the ruptured aneurism. The inner coat was thickened and appeared to consist of different membranes like flesh—membranes which, in some parts, were as thick as the finger, and which in others were lacerated.* The sac contained grumous blood.

When the œdematous limbs were dissected, no serum was found between the muscular fibres; the whole was limpid, and seemed to be deposited in the dilated cells of the adipose membrane; and on the fluid being exposed to heat it did not become turbid, but wholly evaporated. However, the deep yellow serum which was found in the thorax, not only became turbid, but a pellicle formed upon its surface, and was ultimately left in the bottom of the vessel. The serum of the abdomen formed a pellicle, but did not become cloudy.—*Valsalva*, xvii. 25.

From the preceding case, as well as from others, it will appear that although an aneurism be perpetual, some of its consequences may not uniformly be experienced. If from any slight internal cause, such as the swallowing of food or drink, or the existence of flatus in the œsophagus, pressure is made on the aneurism; or if from accidental

* These were laminated concretions of lymph.—*Ed.*

compression on the limbs the circulation of blood through them is retarded, an augmented sense of suffocation is likely to be produced: but, if on the other hand, the vessels of the limbs are opportunely relaxed when the blood begins to accumulate in the aneurism, the paroxysm may be prevented in the beginning. Both these circumstances were manifested in the case of Marquis Aloysio Paulucci, commander in chief of the Pontifical forces, who died in a most distressing manner from a large aneurism. Sometimes his anguish increased when the cause was not obvious; but occasionally when he was menaced with a paroxysm, or when it had actually commenced, the incursion was averted by appropriate measures. From the commencement, when the disease was obscured under the ambiguous form of periodical pains in the left shoulder and the adjacent parts, he experienced essential relief from the immersion of the corresponding hand and arm in hot water; and when the disease disclosed itself more clearly, and accessions which threatened suffocation were urgent, he solicited the heated water to bathe his hands and forehead, and affirmed that his sufferings were more alleviated by it than by any other means. And when, at my suggestion, he resorted to this immersion of the arms on the first intimation of an attack, it often put it by entirely; and from this circumstance the patient derived nearly as much felicity as if he had been emancipated from instant death.

The same remedy, united with frictions of the arms whilst they were immersed in the warm water, was of considerable benefit to two maidens, one of

whom had been seized, at different times, with excessive anxiety at the præcordia, accompanied with a sense of strangulation, and the other with a successive suspension of all the senses. In other cases, though there existed an irremediable organic disease, an astonishing degree of relief was obtained by this simple process. The preternatural track of the colon, mentioned by Valsalva, is not an unfrequent malformation.

Morgagni, 26, 27.

Case 16.

Active aneurism of the heart, with dilatation of the aorta.

When I resided at Bologna, in 1702, a woman nearly eighty years of age often complained to me of her stomach, meaning by this appellation, the lower part of the thorax. Her pulse was exceedingly vibrating; and the difficulty of respiration became so oppressive that she was compelled to sit up in bed: but the urgency admitted of occasional mitigation by taking oil of almonds. At length, however, it increased, so that the woman was suffocated.

Dissection. A considerable quantity of fluid was found in the thorax and pericardium. The parietes of the heart were so thickened, and its cavities so uncommonly dilated, that it resembled the heart of a bullock. The aorta, from the heart to the orifices of its first upper branches, was greatly dilated, and, in nearly the whole of this tract, was lined with osseous lamellæ, which resembled thickly-strown drops of white wax.

The left lung was flabby and half putrid, as if it had long been macerated in water.

Morgagni, xviii. 28.

Malpighi has related an instance which greatly resembled the preceding, in the state of the pulse, in the quantity of water in the pericardium, in the dilatation of the left ventricle and of the aorta, and in the ossification of the latter; and in several respects the two following instances also coincided with it.—29.

Case 17.

Active aneurism of the heart, with dilatation and ossification of the aorta.

The man to whom this case relates was addicted to venery and conviviality, especially when young, and when more advanced in life was loaded with care, and depressed by violent affections of the mind. His uncle had been carried off by some thoracic disease, which was attended with violent pulsation; and in the progress of time this man began himself to feel pulsation in the chest, and to respire with difficulty when he walked upon an even surface; but the difficulty was much increased when he proceeded up an ascent. Almost every month he underwent a distinct paroxysm of difficulty of breathing, so that he appeared in danger of instant suffocation, if blood had not been speedily withdrawn; but by this means he obtained relief. At length he was seized with slight fever, during which his physician particularly observed that the pulse was different from the natural state, and also unusual in relation to the febrile affection. It was exceedingly strong and vibrating, especially in the

left wrist. He had violent pulsation in the region of the heart; and if the hand was applied beneath the left mamilla, it was often violently repelled. He was unable to breathe, except when the neck was upright. The sputum was small in quantity, and bloody. He gradually wasted, as if he had been the subject of hectic tabes; his feet became œdematous, and his strength decreased. His pulse sunk, but did not lose its vibratory character; and the pulsation beneath the mamilla continued, so that even an hour before death, which happened on the fortieth day from the accession of fever, this pulsation was as violent as at any former period.

Dissection. The spleen was hard and black. There was no fluid in the thorax or pericardium. The heart was extremely large, and the veins which crept upon its surface were dilated and in a measure varicous. The parietes of the heart, in general, were thickened, and both the ventricles were dilated, but the left was more expanded than the right. In the left ventricle, the valvulæ mitrales were thrice their usual size, and the carneæ columnæ to which they were united, were likewise much stronger than ordinary. The aorta, from the heart to the vicinity of the emulgents, was considerably wider than usual, and throughout the whole of this course was rigid, in consequence of the formation of osseous lamellæ on its inner surface. The lungs abounded with mucus, and when touched they felt nearly of a tendinous hardness.

Morgagni, xviii. 30.

There probably existed here some hereditary tendency to the disease; and from the blood being

impelled forcibly by the strong parietes of the heart into the diseased aorta, it was not urged forwards by a corresponding action in that vessel: consequently the blood was delayed in the left ventricle, and, of course, dilated it. The right ventricle must also have been distended in a similar manner, though in a less degree; for by the impediment to the transmission of blood through the aorta, the celerity of its motion through the lungs would be retarded. From these circumstances, therefore, and from the augmented weight upon the diaphragm, the difficulty of respiration, and the bloody expectoration may be explained.—31.

Case 18.

Active aneurism of the heart, with dilatation of the aorta.

A washer-woman apparently about forty years of age, and rather corpulent, was repeatedly brought into the hospital within the last six years of her life on account of a difficulty of breathing which presented the appearance of convulsive asthma; and during the continuance of the paroxysms no pulsation could be perceived at the wrists. She returned to the hospital under similar circumstances about the middle of January 1740, and died within fifteen days afterwards. Towards the close of life, she expectorated a thick and purulent sputum.

The body was brought into the theatre for the public demonstrations.

Dissection. On viewing the surface of the body it was observed that there was no intumescence of

the feet, nor of any other external part. On the day after death, when the integuments were removed from the abdomen, it was observed that the muscles began to look greenish, and on the next day the tinge was deepened, though the weather was very cold. The abdominal viscera had not been diseased, but they soon became highly offensive. There was nothing preternatural in the distribution of the radial arteries.

There was no accumulation of serum in the thorax, nor were the pleuræ conjoined. The pericardium, however, was thickened, and appeared of a tendinous structure; and the heart was enlarged. Its parietes were thicker than ordinary, but the interior structure of this organ was natural, with the exception that the sinus of the left auricle was more capacious than usual, and its inner surface displayed greater inequality. The corpuscula Arantii of the aortic valves were thickened, and three coronary arteries originated from the aorta instead of two. The aorta was dilated from its valves nearly to the part from which the inferior intercostals originate: and its coats were thickened, and indurated; and internally they were, in many places, of a yellow colour, and exhibited the usual signs of incipient ossification. The coats of the descending aorta, indeed, did contain some bony laminæ; and as this vessel approached the diaphragm it was figured with longitudinal furrows, which could not be effaced by pulling the sides in opposite directions. This appearance I have observed in other subjects, and shall speak of it hereafter.—*Morgagni*, xviii. 34.

That the thickness of the parietes of the heart instead of being diminished, should sometimes be increased when the ventricles are dilated, may be accounted for by supposing that the blood retained within the ventricle obstructs the return of blood from the substance of the heart: and at the same time a larger quantity of blood enters the coronary arteries, the aorta not allowing of the usual freedom of circulation through it; so that the parietes of the heart receive more blood than usual, whilst less is returned from them.—35.

Case 19.

Aneurism of the heart, and dilatation of the aorta; the aorta ruptured into the pericardium by an indirect canal.

A corpulent man about sixty years of age, died suddenly. He had been affected with tremour, and those who were acquainted with this circumstance supposed that he died of apoplexy.

Dissection. The pericardium was distended with a large quantity of blood. The heart was enlarged; and the aorta was dilated above the heart, and the whole arch was diversified internally with bony scales, some of which were also found in the arteries of the limbs. On the internal surface of the great artery, not far from the heart, a foramen large enough to admit the finger originated, and passing between the coats in an oblique direction, for about the space of three digits, it opened on the external surface of the artery, within the pericardium.—*Morgagni*, xxvi. 15.

CASE 20.

Aneurism of the heart, and dilatation of the aorta and of other vessels; the aorta ruptured into the pericardium.

A Venetian woman about thirty years of age, enjoying a good habit of body, laboured under occasional difficulty of breathing. She was the mother of several children, and ten years before had been seized with paralysis of the lower limbs, from which attack, however, she had recovered. Besides the difficulty of respiration, there existed a pulsating tumour in the neck, in the course of the right carotid artery, yet she never complained of any pain, or of numbness or tumefaction of the right arm. For four or five days before her death, she often complained of a sensation which, to use her own expression, excited an idea that the ribs had fallen towards the abdomen. In the middle of December 1708 she was seized with deliquium animi, her face, and particularly the lips became livid, and she died within a quarter of an hour.

Dissection. The colour of some parts of the intestines and the pancreas indicated inflammation; and on examining the small intestines more attentively I found a part of them, to the extent of the palm of a hand, occupied by innumerable minute tuberosities which were nothing else than cells between the coats of these viscera, distended with extricated gas. The gall-bladder contained four or five calculi, which were found to be inflammable. When the abdominal viscera were removed, the diaphragm displayed a convexity downwards rather than upwards.

Having opened the thorax, I discovered a few ounces of very bloody serum in both cavities. The texture of the lungs was healthy, but the bronchia, especially on the left side, were pervaded with a fluid resembling that which occupied the cavities. The pericardium contained somewhat less than a pound of blood, about two ounces of which consisted of bloody serum, and the remainder was a firmly coagulated lamina. The blood in other parts of the body was fluid. The aorta was dilated from its origin to near the part at which the renal arteries branch off, and the arteria innominata, as well as the carotid and subclavian artery proceeding from it, were so expanded that the carotid, from its commencement to the bifurcation was double its usual diameter The subclavian, which was dilated to the extent of three digits, was not expanded equally in its circumference, but had only its posterior and upper paries curved out into a prominent aneurism, by which two or three of the nerves which pass from the neck to the arm, were compressed. From this aneurism, which would have admitted my thumb, two arteries proceeded, which having an unnaturally broad commencement presented the form of a cone for the extent of a digit and a half, when they regained their usual dimensions. One of these vessels was distributed to the thyroid gland, which was large and indurated in places. Within the iliac arteries, I found no appearance of disease except opaque spots, and some minute furrows. From the renal arteries upwards, the parietes of the aorta were harder and more rigid than usual, and considerably thickened, though not in an equal

degree. In some places there were opaque spots upon the inner surface of this vessel; and in others very considerable parallel sulci, running in a longitudinal direction; and these were the more remarkable on account of their being intersected, at short distances, by transverse sulci. This arrangement being repeated quite to the arch of the aorta, and into the left carotid and subclavian arteries, gave an elegance of appearance to this surface. From the heart to the origin of the first upper branches of the aorta, its inner surface was diversified by spots, and marked out into furrows; but they were confused and irregular, so that it had only an appearance of great inequality. About two fingers' breadths above the semilunar valves, there was ulceration, and also three or four deep foramina, near each other, and each the size of a lentil. From these foramina, winding sinuses proceeded obliquely to the external coat of the aorta, which in that place was of a dark colour, apparently from inflammation, and was greatly thickened by a deposition of humours. In the centre of this discoloration, the tunic was lacerated and blood had been effused into the pericardium. The left ventricle of the heart was greatly dilated, but the contiguous auricle was contracted and harsh.

The cerebrum and cerebellum were flaccid; the vessels of the pia mater were somewhat turgid; and the vertebral arteries, where they enter the cranium, appeared to be a little wider than usual.

Morgagni, xxvi. 21.

Four aneurisms, at least, were found in this woman; namely, one of the left ventricle of the

heart; one of the aorta; one of the right subclavian artery, and another of the right carotid. Although the carotid artery is sometimes dilated by causes which affect it in particular, yet its dilatation is more frequently conjoined with an expansion of the aorta, and is even an extension and effect of it.

The thickening in the coats of the artery arose from the opaque spots; which are the commencement of the process of ossification.—22, 24.

Many instances occur of the coexistence of aneurism in several parts of the sanguiferous system.

Case 21.

Passive aneurism of the whole heart, and dilatation of the aorta; from a mental affection.

A merchant at Padua, sixty-four years of age, actively engaged in business, and enjoying good health, was suddenly exposed to circumstances which induced powerful affections of the mind—occasioning terror, fear, anger, and grief. A few days afterwards he was attacked with vertigo, and fell down; and on the following day he had convulsions, and an attack resembling epilepsy. These assaults were frequent but of a short duration; and were terminated by offensive eructations. The face was alternately red and pale; and a sense of constriction of the stomach and fauces accompanied the paroxysms. The pulse was strong and full, but slow; and the urinary and alvine excretions were scanty.

As bleeding had been repeatedly resorted to without any good effect, the physicians ascribed the disease to the stomach, and purgatives were

employed; but if any thing really mitigated the violence of the affection, it was oil of almonds. On the twenty-seventh day after the commencement of the disease, and when, for some days, he had experienced immunity from its symptoms, the attacks returned with augmented severity, attended with occasional vomiting, singultus, and fetid breath: and though respiration was not difficult, he frequently expectorated some bloody and putrid matter. He had perspiration over the body, whilst the extremities were cold; and occasionally he evinced some wandering of intellect.

On the thirty-fourth day of the disease he voided a dejection of about three ounces of grumous and putrescent matter, and from that time the symptoms became milder; his pulse returned to its natural standard, he regained his former state of health, and continued well during four months. At the expiration of that period, however, the symptoms returned, with slowness of pulse; and they had continued for some months when I was desired to visit him. The pulse was two-thirds less than its natural frequency; but its greatest infrequency was on the approach of a paroxysm. It was remarkable, that during the existence of the paroxysm, the pulse was very frequent. The difficulty of respiration increased, accompanied with cough and expectoration; and the sputum was of a leaden hue. He died like a suffocated person, fifteen months from the first attack.

Dissection. The right cavity of the thorax contained some pints of serum which resembled

urine, and the left was occupied by a redundance of fluid, though not equal in excess with that of the opposite cavity. The upper lobe of the left lung contained a white fluid, that was *puriform* rather than *purulent*. The mucous membrane of the trachea and bronchia was of a reddish brown colour. The pericardium contained a little fluid similar to that in the thorax. The heart was greatly enlarged, not from thickening of its parietes, but from the dilated state of its cavities. The carneæ columnæ in the right ventricle, however, were enlarged, as were also the valves; and the orifices of the coronary arteries were dilated. The aorta, from its origin to the beginning of its curvature, was dilated; and on its internal surface there were small protuberances where the coat was thickened, indurated, and generally white. The intestines were inflated with gas; the liver was somewhat indurated, and of a bluish tint. The spleen was slightly enlarged; the mucous coat of the stomach was of a reddish brown colour; and amongst the convolutions of the intestines there was no inconsiderable quantity of serous fluid. The cranium was not opened.

Morgagni, lxiv. 5.

Here was a case of dilatation of the whole heart and of the aorta, originating from an affection of the mind, through the medium of the nervous system. Something must have been superadded to the aneurism, to have occasioned the slowness of the pulse.—6.

Case 22.

Aneurism of the left ventricle of the heart, and dilatation of the aorta; with cerebral congestion.

A man apparently about sixty years of age, who three months before had been in this hospital on account of difficulty of breathing, accompanied with the expectoration of an illaudable sputum, was affected with extreme difficulty of breathing, after exposure to cold in March 1742. On the following morning he was brought into the hospital again, and died soon afterwards. At the request of the students I examined the body on the following day.

Dissection. The face was somewhat tumid and red. The cranium having been sawn through some time previous to my arrival, nearly a pound of blood had flowed out of that cavity. Nevertheless I conjectured that the principal cause of death existed in the thorax, and that the blood had accumulated in the head in consequence of thoracic disease, as usually happens to persons who are suffocated by those lesions.

When the sternum was reflected, the lungs were so turgid as completely to fill the cavities of the chest, and the right lung adhered to the costal pleura. There was a considerable quantity of fluid in the thoracic cavities. It was transparent, and of the colour of urine: and a small redundance of a similar liquid was contained in the pericardium. The valves of the pulmonary artery were a little thickened; the left ventricle was dilated, but the parietes were of the ordinary thickness; the mitral

valves were indurated and thick, and the edges of all the semilunar valves were white and hard, and were so thickened as to equal a line and a half of the inch of Bologna.

The trunk of the aorta was considerably dilated from its valves to the curvature; and beyond this part its diameter was sensibly increased, though in a smaller degree. Throughout this tract its parietes were thickened, and felt much harder than is usual; and its inner surface was rendered unequal, especially within the space of its greatest expansion, by numerous white and yellowish rudiments of ossification.

In the lateral ventricles of the brain there was a considerable excess of fluid, similar to that which occupied the thorax; and the falx was thick and hard, but the texture of the brain was healthy. It was evident that the blood had issued from the meningeal vessels, which had been lacerated by the saw; and probably it was mixed with serum.*

Morgagni, xxvi. 33.

During the time of carrying bodies from one place to another, and turning them about on every side, sometimes having the head downwards, and at others the feet, the blood, especially if fluid, as it was in the preceding instance, and in many others, is liable to be dislodged. Therefore we are not to

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* Consistent with what has been said on the subject of apoplexy from active aneurism of the left ventricle of the heart, it may be supposed that plethora of vessels in the head would generally arise from aneurism of that cavity of the heart; but a state of vascular plenitude, and even apoplexy, have arisen from dilatation of the auricles.—*Ed.*

wonder if it is not always accumulated in those parts where we have reason to expect it: and a considerable quantity must escape when the viscera are taken out of their respective cavities.—34.

Case 23.

Active aneurism of the heart; the aorta and pulmonary artery dilated; with cerebral congestion.

A woman sixty-four years of age, was distressed with violent palpitation of the heart, and a corresponding pulsation was conspicuous on both sides of the neck; but in the radial arteries the pulsations were unequal and somewhat obscure. Respiration had previously been difficult, but during the last days of life it became so much more oppressive, that she was unable to breathe except with the neck upright. Both hands became œdematous, and the inferior extremities were affected with œdema in a still greater degree, and these swellings were accompanied with a general tumefaction of the abdomen. She died in this hospital about the middle of February 1741; and on the first or second day after death I inspected the body.

Dissection. Blood dribbled from the mouth of the corpse. The swelling of the hands had disappeared, but that of the abdomen and legs continued.

The lungs were turgid and of a whitish colour anteriorly, but their posterior surface, as usual, was of a saturated red colour. Both cavities of the thorax, and also the pericardium, contained a considerable quantity of yellowish serum. The

cavities of the heart were distended with blood, and were somewhat more capacious than usual, especially the left auricle. The pulmonary artery and the aorta exceeded their ordinary diameter, and the whole of the valves were enlarged. Nearly all these circumstances, however, were in relative proportions. In the larger valvula mitralis there was a small semilunar orifice, through which the probe ascended, betwixt the membranes of the valve, to the extent of about a line. It is probable that this was not the result of disease, for I have more than once observed a small disjunction of membranes in the valves of the heart, and supposed it to be congenital. When the aorta was opened from the heart to the diaphragm, some obscure longitudinal lines were observable, extending from the heart to the curvature of the aorta; and at the curvature an opaque spot existed. The internal coat, when pressed with the finger or scratched with the nail, might easily be torn off in large pieces.

The bronchia contained frothy mucus, which in some places was bloody, and in others the mucus presented the appearance of pus.

The brain was in a state of sanguineous plethora. I entertained no doubt that there had been effusion of serum into the abdomen, but there was no time to open this cavity, nor did I think it necessary.

Morgagni, xxiii. 6.

Case 24.

Aneurism of both ventricles, with dilatation of the aorta and pulmonary artery; the pulse unaffected.

The subject of this case was a man who for two months had been in the hospital, with unfavourable symptoms of thoracic disease. For in addition to a fistula, which indeed did not penetrate the cavity of the chest, he had palpitation of the heart, and preternatural pulsation, both which symptoms had commenced a year before, and though not uniform in degree, they were often discoverable to the eye when the chest was uncovered. The pulsations of the radial artery did not vibrate. He expectorated so large a quantity of puriform matter, that, had it not been distinguished from pus, a supposition might have been entertained, that the fistula really did enter the thorax. When the patient died, which occurred in January 1757, Mediavia dissected the body.

Dissection. The lungs were healthy. Both the ventricles of the heart were dilated, but the thickness of the parietes was not diminished. The trunk of the pulmonary artery exceeded its natural diameter; and that of the aorta was greatly dilated, quite to the beginning of its curvature. The inner surface of this vessel was white, hard, and unequal.

Morgagni, lxiv. 12.

Case 25.

Incipient aneurism of the heart and aorta; with diseased liver.

A shoemaker of middle age, who, according to his own statement, had not been addicted to any

other irregularity than that of drinking wine in excess, was attacked with general lassitude, and with palpitation in the region of the heart, accompanied with difficulty of breathing. The symptoms increasing daily, Paul Selano, a most experienced physician at Bologna, supposed, at the expiration of four months, that he laboured under an aneurism, and directed blood to be withdrawn repeatedly. At length occasional syncope was added to the other symptoms, and he came into the hospital of St. Mary de Morte. The swooning and difficulty of breathing were most violent in the night, especially when attempting to sleep; and whenever he was attacked by these symptoms, his right arm became violently painful, as if it had been torn in pieces. I scarcely recollect to have witnessed a case in which the pulsation in the region of the heart, extending to the umbilicus, was more violent. It was perceptible to the eye, and though most considerable in the thorax, yet in that part of the abdomen which has been mentioned, the hand was struck so forcibly when laid upon it, that every one inferred there was an abdominal as well as a thoracic aneurism. The man said that he felt the pulsation every where, even to the extremity of his toes. The carotid, the temporal, and the radial arteries were agitated by strong and vibrating pulsations. The feet were slightly tumefied.

He scarcely partook of any food; there was no fever, and when the difficulty of respiration was least urgent he could assume the horizontal position on either side, yet he felt as if death was really preferable to his sufferings: and this event happened

on the fourth day subsequent to his coming into the hospital. He had risen to evacuate the bowels, and scarcely had returned into bed, when he found himself unable to respire, except with his neck elevated; and in that paroxysm of dyspnœa he died. I dissected the body on the first of July 1705.

Dissection. The lips were very livid. The right cavity of the thorax contained yellowish serum; the whole convex surface of the left lung adhered to the costal pleura by a soft adventitious membrane, which could be separated from the pleuræ without laceration. This appeared to be the relick of a former peripneumonic affection.

The pericardium contained a little turbid serum; the heart was moderately enlarged, and the blood was black. In the course of the aorta from the heart to the bifurcation into the iliacs, there were slight unequal sulci drawn longitudinally. None of the cavities of the heart, however, nor any vessel in the thorax or abdomen, had become dilated.

There was a considerable accumulation of yellow serum in the abdomen. The colon, from the region of the liver to its termination, was contracted into narrow cells; the stomach was greatly contracted, but this might be accounted for from his not having taken food for many days. The liver was somewhat hard, and marked with spots on its superfice, resembling a kind of small granules.

Morgagni, xxiv. 34

The vehement action of the heart and arteries in this case, undoubtedly arose from the same cause

from which it arises in most persons in the incipiency of aortic aneurism, namely, the influence of the nervous system on the action of the heart and vessels; and nothing tends more to induce this excessive action than a stimulant plan of diet. In persons addicted to drinking, I have known this happen several times, and in all of them I believe the pulsation had been owing to the influence of the nerves, as there were no particular indications of other diseases; or, if there were, they sustained an intimate relation to the nervous system. I am confirmed in this opinion by various observations. A case is extant in which, after cerebral pulsation, palpitation in the heart and arteries came on, which was perceptible to the extremities of the fingers. In a matron of Padua, Rhodius suspected the affection arose from the uterus; and he alludes to another case, which also was ascribed to the same organ. When the heart is flaccid I ask how it can occasion a full and strong pulse, except through the influence of the brain and nerves.—35.

When aneurisms do not begin in the vessels from laxity of the membranes, from ulceration, or injury, but from powerful action of the heart and arteries, the first lesion of the artery which discovers itself is the appearance of sulci in the inner coat; and after this, other injuries follow in the next coat, earlier or later in proportion to the impetus of the blood. In counteracting the progress, much may be effected by diet.*—37.

* Morgagni does not appear to have attached all the importance to the morbid state of the liver, in explaining the phenomena of this case, to which the diseases of that organ are entitled.

Rupture of the heart.

The first case of rupture of the heart, as far as I have been able to ascertain, is given by Harvey, in

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After the habitual excitation which results from the abuse of vinous or spirituous liquors, no organ so frequently exhibits marks of disorganization as the liver; and when it becomes diseased, it is familiarly known to exert a morbid action, or a reaction, on the general system, or on some individual function.

The following is a remarkable case of enlargement of the heart, in complication with that of the liver, from the abuse of ardent spirits. It is related by Dr. Gairdner.

A man thirty-two years of age had been healthy till three years before his death, but was addicted to ardent spirits. The symptoms of disease were, great pain and oppression, with fulness in the two hypochondria and in the epigastric region; and he was most easy in the horizontal position. An unusual pulsation could be perceived in the left hypochondrium, corresponding with that at the wrists, which was a hundred and twenty, full and strong, but regular. Respiration was hurried and oppressed; his countenance was rather livid and anxious; his tongue white, and the bowels torpid. His feet ultimately became œdematous, and his pulse irregular. Previous to his last illness he had been very much subject to incubus.

Dissection. The abdomen contained a serous fluid; the liver was enlarged and hard, and lymph was concreted on its surface; the gall-bladder also was full of bile. The liver weighed $5\frac{3}{4}$lb. dutch. The spleen was also enlarged and hard, weighing $1\frac{1}{4}$lb. There was slight effusion of serum into the thorax. The heart in size resembled that of the ox, and was equal in all its proportions. It weighed $2\frac{3}{4}$lb. The sinus valsalvæ of the pulmonary artery was ossified.

The uterus has been adverted to as an occasional source of deranged action in the heart. I recently attended a case of abortion in which the action of that organ was rendered extremely slow, irregular, and intermittent. It only beat two and forty in the minute, but the pulse was moderately full. After every two or three pulsations, in which, indeed, there was no regularity, there

which the substance of the left ventricle was perforated by an opening adequate to admit a finger. The patient had often been seized in the night with an oppressive pain in the chest, with a tendency to swooning, or with a sense of suffocation.

Peter de Marchettis related another instance, in which the left ventricle was opened by a fistulous ulcer.

Morand has mentioned a case of rupture of the left ventricle of the heart near the orifice of the aorta, although no symptoms of the disease had preceded. The patient was a nobleman, and he died suddenly, by the side of his wife, in bed.

Morgagni, xxvii. 1.

The following case I met with at Venice, in the year 1707.

Case 1.

Rupture of the left ventricle of the heart; the annulus venosus and valves ossified; osseous tumours in the head.

A fat and masculine woman, seventy-five years of age, became a valetudinarian in the last years of her life. The leading feature of the disorder under which she laboured was a tendency to syncope, and other affections of that nature. Not knowing how to express herself correctly, she, in common with other inhabitants of the same village, designated these attacks, *wind*. Within the last six months of her life, these complaints became much

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was intermission which lasted from two to four seconds. During this time there was no affection of the head; and the actions of the heart progressively became regular as the uterine operations were accomplished.—*Ed.*

more severe; and having for some days drank new wine, and felt a little worse in consequence, she suddenly exclaimed, that she perceived something move up and down within her. Presently afterwards she said that the house seemed to totter, and stertorous respiration and death speedily ensued. The body was examined on the following day.

Dissection. A bloody fluid was dribbling from the mouth. The cellular substance upon the pubis was four digits in depth. The cartilages of the ribs did not resist the knife any more than in youth. The abdomen contained so much fat, that the diaphragm was pressed high into the thorax, and from this circumstance it did not appear surprising to those who were present, that decumbence on the back should not be an easy position to fat persons, unless their shoulders are considerably elevated.

The posterior surface of the left lung adhered to the costal pleura. The pericardium contained a large quantity of blood, part of which was fluid; and the diameter of this capsule was nearly equal to a span. The heart itself was extremely fat, and in the parietes of the left ventricle a foramen the size of a lentil existed. At the left annulus venosus there was a deposition of osseous matter in the form of a semicircular bone, upwards of an inch thick. To this osseous substance the mitral valves adhered, and were themselves likewise ossified; but a considerable part of one of them was so free as to close the orifice, which was contracted by the bony matter. The valves of the aorta were ossified. The pulmonary artery and aorta were full of blood. From the curvature throughout its course the aorta

was ossified in places, and not wholly free from appearances of ulceration. Some of the abdominal branches of the aorta, especially those of the cœliac artery, were involved in the ossific process.

The spleen was turgid with frothy blood. The gall-bladder was greatly contracted, and filled by fourteen calculi of different sizes, of a cubical figure, and inflammable. The right kidney had a superficial ulcer on one part; and on other parts it exhibited small cicatrices. The texture of these viscera was flaccid.

The dura mater was found so closely united with the sutures and their adjacent parts, especially with the sagittal and lambdoidal, that it could not be disunited from them without laceration. There was fluid beneath the pia mater, and in the lateral ventricles. The cerebellum was soft. The coats of the basilary artery, and of other arteries about the cerebrum, were indurated.

On the basis and concave surface of the os frontis there were numerous osseous prominences; and similar appearances presented themselves in the basis cranii, and especially on the petrous portion of the temporal bone: but they were smaller on these parts—more distant—and less elevated. All these tuberosities were constituted of a whiter substance than that of the bones of the cranium, and seemed to consist of a new deposition of bony matter. Although their surfaces were smooth they must necessarily have compressed the cerebrum.—*Morgagni*, xxvii. 2.

I did not consider the bony tuberosities so much of the nature of exostoses, as of an accretion of new

bone, of the nature of vegetations. The woman had not complained of pain in the head, or of any other affection of that part.—4.

Case 2.

Rupture of the left ventricle from ulceration.

A woman who laboured under palpitation of the heart, having raised herself up in bed to eat her dinner, exclaimed, "I am dying," and she almost instantly expired.

Dissection. The pericardium was distended with coagulated blood, which had been effused from the left ventricle of the heart. This ventricle was perforated, at the apex, by a small ulcer.

Morgagni, xxvii. 5.

The preceding case was related to me by that excellent man Anthony Marisati, when he was assistant physician to this hospital; and the following was communicated by Laurence Mariani.

Case 3.

Rupture of the left ventricle from ulceration.

The subject of this case was a knight sixty-five years of age, of a strong constitution, who, during some years had suffered from obstinate ulceration of the legs; but being weary of these ulcers they were healed by medicines administered inwardly, and by outward applications. At length he was affected with rheumatic pains, but they were so slight as not to prevent him from going out, which he continued to the day preceding his death. On the 9th of June he was attacked with violent pain beneath the sternum and in the arms, with some

confusion of mind. About the middle of the same day he was partially relieved, and though his pulse was languid, yet he was cheerful. He afterwards complained of a sensation of fumes ascending to the head, and also of tightness across the chest; as well as restlessness and anxiety. After these symptoms had continued for some time, he became pale and agitated, and suddenly expired.

Dissection. The pericardium was distended with blood of a black colour, which had been effused from the left ventricle of the heart through a fissure half an inch in length, and in the longitudinal direction of the ventricle. The fibres in the circumference of the rent were destroyed by ulceration.

Morgagni, xxvii. 8.

Case 4.

Aneurism and rupture of the left ventricle of the heart.

A physician fifty-eight years of age, very hypochondriacal, and of a wan complexion, twelve months before the fatal catastrophe began to suffer a sensation of pain ascending from the abdomen to the thorax, accompanied with convulsive and anxious respiration. These symptoms were mitigated by repeated bleedings; but at length they returned as violently as at first, and on the following day he was suddenly cut off.

Dissection. The intestinum ilium, for some extent, was of a dark colour; and the liver was considerably enlarged.

The pericardium contained a considerable quantity of blood, which had been effused from the left ventricle by three foramina. The cavity of this

ventricle was dilated to three times its usual extent.—*Morgagni*, lxiv. 15.

I formerly said, that instances of rupture of the right ventricle of the heart were much more rare than of the left; I still believe them to be more uncommon, but not so much so as I considered them at that time.

Morand has mentioned an instance of this nature; and Christian Vater has also related a case of rupture of the right ventricle, to the extent of more than a finger nail, from a violent blow given by a carriage which was passing the man. There was no appearance of any previous morbid disposition. Two cases are related by Haller, and others are on record.—*Morgagni*, xxvii. 10, lxiv. 16.

Lancisi ascribed rupture of the heart to a feeble state of its fibres, and likewise to ulceration. Morand has written and collected more than any other person on the subject of rupture of the heart, and has given a striking instance from each of these causes. They both happened in 1750; one in a princess, considerably advanced in life, the right ventricle of whose heart had become ulcerated externally, and the ulcer, by degrees, had penetrated the cavity, and blood was consequently effused into the pericardium. The other was the case of a nobleman, whose pericardium was filled with coagulated blood, and the heart was so extremely flaccid that it could be pierced through by the weight of a probe. The blood had been effused from the left ventricle through a fissure about eight lines in length, in the middle of that ventricle.—xxvii. 7.

Case 5.

Perforation of the right ventricle of the heart, and of the diaphragm.

In November, 1688, a man thirty-five years of age, was wounded with a knife in the middle of the sternum between the fifth and sixth ribs. Great prostration of strength immediately ensued; the pulse was scarcely perceptible, and his physician expected death would speedily occur. After the lapse of three hours he had regained a degree of strength, and was brought into the hospital of St. Mary de Vita. On the following day he had a troublesome cough, and urgent diarrhæa; but on the sixth the latter ceased, whilst the former increased daily, to such a degree as to be scarcely tolerable. From the first days there was a sensation of prodigious weight in the abdomen, which, in the progress of the disease, extended over the whole of that cavity; but no similar feeling existed in the thorax. During the earlier days after the injury was inflicted, the pulse was full and moderately quick; it continued quick, but daily became smaller, and on the eighth day he gradually expired.

Dissection. As soon as the thorax was penetrated on the right side of the sternum, blood gushed from that cavity; and when the cavity was cleared of blood, more was observed to pour from the abdomen through a wound in the diaphragm. The abdomen contained a large quantity of blood. The pericardium, right ventricle of the heart, and mediastinum, were transfixed as well as the diaphragm.—*Morgagni*, liii. 3.

In deciding upon the parts which may be injured

by a penetrating wound of the thorax, the arched situation of the diaphragm, and the circumstance that part of the abdominal viscera are within the ribs must not be forgotten. The liver, and other abdominal viscera, have many times been perforated through a wound in the diaphragm.

Beside the preceding example there are others which show that wounds may penetrate the ventricles of the heart, without immediate death being the consequence. When there is reason to apprehend that the heart is wounded, and that blood has been effused, if there is no sense of weight in the thorax, but an increasing consciousness of it in the abdomen, there will be ground of conjecture that the diaphragm is so wounded as to transmit blood from the thorax into the abdomen; especially when some other symptom tends to confirm the opinion: of this nature was the almost intolerable cough in the case before us.*—4.

The ventricles of the heart have been lacerated from an injury of the thorax, whilst the pericardium has remained entire. A man had received a leaden bullet in his chest, and died a few hours afterwards. The bullet was found exterior to the pericardium; nevertheless the right ventricle of the heart was ruptured. In such cases it is probable that the ventricle was dilated at the moment the percussion happened. For in proportion as the parietes of the right ventricle, (being naturally thin,) are attenuated by dilatation, it will be

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* Other instances of wound of the diaphragm will be brought forward in the sequel of this chapter.—*Ed.*

proportionably more susceptible of lesion from percussion.

Wounds in the right ventricle are more frequent than in the left, because the heart is so situated as to expose that ventricle most to injury. When the left has been wounded, life has not been preserved so long as after wounds of the right. In the former case it has not exceeded four or five days, and generally has happened much earlier: in the latter, a period of twenty-three days has elapsed from the reception of the injury to the fatal termination. The difference of time to which life is protracted after a wound of either ventricle, may arise from the extent of the wound, its obliquity or straightness, or from some obstruction presented to the escape of blood by coagula, or by the reticulated fibres within the ventricle being placed in opposition to the wound.*—*Morgagni*, liii. 27.

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* There are two forms of rupture of the heart spoken of by Corvisart, namely *complete* and *partial*. By the former is meant the bursting of the parietes from the interior to the exterior surface; and by the latter is meant that state when only a portion of the heart is ruptured, as the carneæ columnæ, and chordæ tendiniæ, which circumstance he had witnessed. "Complete rupture of "the heart," says that author, "has rarely been observed in the "healthy state of this organ. Some instances, however, may be "cited, of this organic lesion, in consequence of a violent effort, "a fit of passion, an epileptic paroxysm, or *in actu coitus*." It is highly probable that, in the case by Morand alluded to above, the rupture took place from the last mentioned cause. Dr. Hebb, the translator of Corvisart, has referred to the death of George the Second, as affording a strongly marked instance of rupture of the right ventricle of the heart, without any previous symptoms of disease in that organ, and unattended by any of those circumstances which are said occasionally to produce it. Morgagni

Palpitation of the heart.

That inordinate action of the heart which constitutes palpitation, may arise from disease in the

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had evidently this sovereign in view when he glanced at the death of "a most powerful monarch," xxvii. 10, but he has erroneously reported it to have been an oblong fissure in the *left* ventricle.

A case has been related by Dr. Fischer, in which it was believed, that, without any pre-existing disease, the left ventricle was ruptured by the concurrent influence of cold, vomiting, spasm, fatigue, and singing, with a mental affection. The patient was an elderly gentleman; and on the 16th of October he was seized with a paroxysm of pain, which he supposed to be cramp in the stomach. The paroxysms recurred till the 20th, when he died. Two or three pounds of blood were found in the pericardium, and a rupture was discovered in the aortic ventricle.

Med. Repos. May, 1819.

Several cases of ruptured heart have been published by Portal and other anatomists. They concur to show that it most frequently happens to the left ventricle, and, generally, in consequence of disease in or about the mouth of the aorta. Many of these cases prove that the laceration in the heart was not preceded by any obvious change in the muscular structure. In five instances published by Dr. Rostal, (four of which, if not all, occurred to women upwards of seventy) the rupture was in the left ventricle. In three of them the ventriculo-aortic orifice was ossified; in the fourth the aorta itself had undergone this change, but in none of these had there existed any previous change of structure in the heart. The fifth case confirms what has been already stated by Morgagni, that these injuries do not necessarily prove fatal immediately, even when the heart is completely perforated; and indeed it is sometimes susceptible of cure. The following are the particulars of this case.

A woman seventy-one years of age, had experienced severe pain in the left thoracic region, and in the epigastrum, for fifteen years. Reclination induced a sense of suffocation; she had frequent syncope, violent palpitation, startings when asleep, inordinate appetite, and extreme sensibility.

Dissection. The pericardium adhered to the heart by means

heart itself, or from the affections of other organs contiguous to it, or situated remotely. In many of the preceding dissections these circumstances have been elucidated, but it will be proper to add some which have not yet been spoken of distinctly.

Palpitation sometimes arises from the influence of the mind, exerted through the medium of the nervous system, as happens to persons in health under the dominion of certain passions: and the same effect may be produced from other causes acting upon the brain, irrespective of mental agency. It may sometimes be excited by causes applied to the nerves, without apparent injury being immediately inflicted upon the brain. It has arisen from a disease in the foot: and those palpitations which occur in hypochondriacal and hysterical patients, are also ascribable, wholly or in part, to disordered action excited through nerves which communicate with the vessels or with the heart. The nervous system, in these persons, is too highly susceptible of sudden and irregular action,

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of several albuminous laminæ. Blood was effused into the posterior part of this cavity, and an irregular rupture was perceived when the laminæ were removed from the heart, an inch and half long. It was evidently of recent date; but on its left side, to the extent of five or six lines, the substance of the heart was destroyed, and replaced by a fibrous concretion, like that in aneurismal sacs. The ventricle was extenuated in this part, but thickened every where else. It is remarkable that the rupture took place not in the point of the old lesion, but in its vicinity. There is no doubt that the loss of substance in the heart was of very old date.—*Nouveau Journal de Med. Avril*, 1820.

Union between the ruptured part of the heart and the pericardium, by adhesive inflammation, may conduce to a protraction of life on these occasions.—*Ed.*

and therefore they are seized with palpitation from the slightest degree of mental emotion.

Amongst the organic diseases which particularly occasion this symptom, cases have been adduced in which it accompanied diseases of the pericardium, aneurism, and other diseases of the heart and its valves. And numerous instances will be brought forward in which it was attendant upon inflammation and other morbid conditions of the aorta and its valves. It sometimes happens, however, that the causes of palpitation are present, whilst that effect is not produced. It is well known that the heart, in cachectic persons, rarely palpitates whilst their bodies are quiescent; but on the least exertion, especially when ascending an acclivity, that organ is powerfully agitated. It is often exceedingly difficult to distinguish sympathetic palpitation from that which is idiopathic; for it frequently occurs that, although the heart itself contains the cause of its unnatural movements, yet the effects only recur at intervals.—*Morgagni*, xxiii.

Diseases of the aorta and of other vessels.

Case 1.

Inflammation of the aorta, with enlargement of the heart.

The wife of a painter at Padua forty years of age, and the mother of four children, who was not addicted to excess in eating or drinking, but of a delicate constitution, and on that account, as well as in consequence of certain causes of anger and grief, she was irascible; and, for a long time, she

had lost her appetite. There was no deficiency of menses at the time she began to be afflicted with palpitation of the heart—an affection with which she was distressed, in variable degrees, to the day of her death. In addition to palpitation of the heart, she had a sense of erosion in the thorax; and this sensation, as well as the palpitation, extended to the side of the spinal column. When alimentary substances had descended through the œsophagus nearly to the stomach, some difficulty arose before they entered the cavity of that viscus. She had pains in different parts, but especially in the arms; and the body was anasarcous, but the tumefaction was greatest in the right leg. Some of the physicians who saw the case, supposed that there was aneurism of the aorta; others, observing that she could easily lie on either side, and that the pulse was neither vibrating nor intermittent, considered it an hysterical affection. She died suddenly about the 20th March 1726.

My excellent colleague Anthony Vallisneri communicated to me these particulars, and requested my presence at the dissection. I observed to him that after many violent affections of this nature, it had occurred to me, more than once, not to find an aneurism, but some disease of the inner surface of the aorta.

Dissection. Though many hours had elapsed from the time of decease and the weather was unusually cold for the season, yet the body was still warm. Both cavities of the thorax contained a considerable quantity of serous fluid; but the greater redundance was on the right side. The

lungs were in a healthy state, but the pleuræ were adherent at the lower and back part of the left lung. There was no appearance of disease in the trachea nor in the œsophagus, though opened quite to the stomach. Nor was any lesion discoverable in the mediastinum, or in the pericardium. The aorta seemed to be a little contracted, and the heart was somewhat enlarged. The corpuscula in the border of the aortic valves were harder and larger than usual, especially one of them. The whole internal coat of the aorta, from the heart to below the emulgent arteries, was evidently inclined to a slightly yellow colour, and had some inequality of surface. When attentively examined the inequality appeared to consist of slight protuberances and depressions. In the vicinity of the emulgent arteries, the internal lamella of the aorta could be easily rubbed off by lightly applying the nail to it; and a little above the semilunar valves there was a narrow ulcer, where the fibres were displayed in a divided state. There was no induration of any part of the aorta, but the morbid appearances which have been described extended into some of the upper branches. There was a considerable quantity of fluid in the abdomen. The omentum was contracted; the stomach was large, and full of humour; the liver was pale, and the gall-bladder contained a little discoloured bile. The spleen was indurated.—*Morgagni*, xxiii. 4.

The disease induced in the upper part of the aorta, and in its superior branches, may be accounted for from those affections of the mind which have been mentioned, acting, through the nervous

system, on the larger vessels, and those nearest to the heart. The mental distress would also exert much influence on the organs of digestion, so that chyle very unsuitable for the purposes of nutrition would be prepared from the aliments taken in.

Case 2.

Inflammation and incipient ossification of the aorta, with cerebral congestion.

A reputable man not quite sixty years of age, became corpulent about the thorax and abdomen, but not so in the lower extremities. He was subject, at intervals, to a dry cough and difficulty of breathing, especially after taking food. In the beginning of May 1729, when, in other respects, he appeared to be in the enjoyment of excellent health, he complained to a friend that his head was confused, and soon afterwards, having supped very sparingly, he was seized with cough, which at first was slight, but rapidly increased in violence. He foamed at the mouth, and before his physician arrived he was dead. Some bloody fluid afterwards dribbled from the mouth and nostrils. This event happened at a period when there were many sudden deaths in the city and its environs.

Dissection. The external part of the thorax of this man was extremely fat, and there was a considerable quantity of adipous substance in the mediastinum. The pleuræ were united anteriorly, and both cavities of the thorax, and also the pericardium, contained bloody serum. The heart was in a natural state, but the aorta, from its origin to its

arch, seemed to be broader than usual. Its internal coat was marked here and there with white spots, and was unequal; and, what seemed to me more important, it was of a reddish black colour, as if it had been affected with inflammation. The appearance of opaque spots did not extend farther than the dilated part of the artery; but the other morbid changes were evinced beyond the arch, where the artery descends upon the vertebræ, though not in so great a degree as in the expanded portion. They were continued into the arteria innominata.

The vessels of the pia mater were turgid with blood; and the lateral ventricles were occupied by a somewhat bloody serum. The abdomen was not opened.—*Morgagni*, xxvi. 35.

In numerous cases of sudden death which have been observed by my friends, no morbid appearances have been discovered except disease in the aorta.*—36.

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* An increased redness is often observed within the aorta, but distinct inflammation has seldom been noticed. Mr. Hodgson has related a case which was communicated to him by Dr. Farre in which there had been effusion of lymph. It was intimately connected with the inner coat of the aorta, and a plug of it had extended into the left subclavian artery, and nearly obliterated the cavity of that vessel. The man had been attacked with violent pneumonia. In a young man who had committed suicide by taking a large quantity of arsenic, and who died about ten or twelve hours afterwards, I found, amongst other morbid appearances, a deep redness to the extent of a three-shilling piece within the right ventricle; and, at the root of the aorta, there was a corresponding appearance as to colour, and some small

Aorta pustular.

Jano Planco assured me that he had sometimes dissected persons who were taken off by sudden death in whom he neither found the aorta ruptured nor dilated, but affected with pustules and prominencies containing a softish pultaceous matter. In an instance when attempting to remove a part of the aorta, it was observed that its external coat could easily be drawn away from the trunk and branches, just as if it had long been macerated in water; and when any one of the larger of these prominencies was cut into, it exhibited a cavity which contained that kind of matter just spoken of. Many of the smaller ones, when exsiccated, appeared as if they were bony; but as the evaporation of the more humid parts of this pultaceous matter produced the change, it is probable that on more accurate examination they would have been found more of the nature of tophus, or of indurated gypsum, than of true bone. The disease was propagated into some of the branches of the aorta, and is no doubt that state which sometimes precedes the formation of concretions.—xxvii. 29.

The following is the case alluded to, which Planco favoured me with, towards the end of 1728, a few days after he had examined the body.

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spots of coagulable lymph were loosely adherent to the inner membrane. The youth was of a strumous habit of body.

In an old man whose toes had sphacelated, I found some of the arteries ossified, and others nearly filled with coagulable lymph.—*Ed.*

Case 3.

Aorta diseased and ruptured; fungous substance in the kidneys.

A nobleman fifty-nine years of age, of a black complexion, and healthy, but who had been addicted to venery from his youth, and who drank wine and spirits freely, was seized every evening with sternutation, which lasted for a quarter of an hour or more, and continued to recur in this way for two or three years. At that period he began to be emaciated, and in the last months of life he was affected with a sensation as if about to faint. He continued to drink spirituous liquors; and one evening, having come home and drunk of them once or twice, his domestics supposed he had gone out, but five hours afterwards he was found dead and cold.

Dissection. A considerable accumulation of serous fluid, of a greenish colour, was discovered in the ventricles of the brain. The vessels of the pia mater, even those of the plexuses, were much enlarged and harder than usual; and when dried they exhibited the appearance of ossification: the vessels of the dura mater had also their coats somewhat thickened.

The lungs were flabby, and the left was closely connected with the costal pleura and diaphragm, except where there existed some extravasated blood. The pericardium contained a large quantity of blood. The heart was enlarged from dilatation of the left ventricle. The aorta and pulmonary artery were somewhat expanded; and the former had ruptured at about a finger's breadth from the

heart; and, near the orifice, the aorta appeared as if it were ecchymosed. The whole internal surface of the artery was in that unequal and pustular state which has been described, and the disease was continued through the subclavian, carotid, and coronary arteries, the latter of which were so dilated as to equal the size of the left carotid.

The spleen was small and flaccid; the kidneys also were flabby; and the place of each pelvis was occupied by a kind of spongy substance. As it was known that a bullet had lodged in this nobleman's left thigh for thirty years, I cut into the part, and found it tightly enveloped in membraneous structure.—*Morgagni*, xxvii. 28.

In the case of Trombelli, an eminent physician and surgeon at Bologna, who died from the rupture of a blood-vessel in the anterior mediastinum; a tubercle the size of a large nut had formed between the coats of the aorta, near the heart, full of a humour verging to the colour of the vitellus ovi.

He had undergone deep mental afflictions, and afterwards experienced slight palpitations of the heart, and was occasionally affected with transient deliquia animi.*—xxvi. 39.

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* "One of the most frequent appearances of disease in the "coats of arteries" says Mr. Hodgson "is produced by a depo- "sition of atheromatous or purulent matter in the cellular mem- "brane that connects the internal and middle coats of the vessel. "The diseased part is of an opaque yellow colour, and generally "somewhat elevated from the surrounding surface. Sometimes "these elevations are considerable and very extensive; whilst at "others they are circumscribed and have a pustular or tubercular "appearance." They contain matter varying in consistence

Excrescence and ulceration of the aortic valves.

CASE 1.

A miller's servant, thirty-six years of age, became diseased, and died under circumstances which seemed to indicate hydrothorax. His legs were œdematous, and the pulse was extremely weak. He had virulent gonorrhœa at the time.

Dissection. There had been effusion of fluid, not only into the thorax, but also into the abdomen; and the viscera in both these cavities were inflamed. The lungs were dense. The aortic valves were occupied by short and irregular excrescences, and were so approximated as to leave a very narrow orifice for the transmission of blood. When examining them individually with more attention, I found that the border of the right valve was shorter than usual, and that the left was ruptured, through the middle, from the border to the base; and from the lips of the ruptured valve other excrescences sprouted. Although the general texture of these valves was more flaccid than natural, yet, when they were rubbed between the fingers, some particles like cartilage could be perceived. This disease had originated in ulceration, and the internal surface of the contiguous ventricle participated in it. The borders of the mitral valves, in places, were somewhat thickened and indurated.

The large intestines were inflamed and fetid, and the liver was enlarged and pale; and on its

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from cheese to common pus. The accumulation of curdy matter has sometimes been so great as to obliterate the cavity of an artery. Calcarious matter is occasionally deposited in the centre of these eminences.—*Ed.*

external surface there was a brownish reticulation, with which small white spots were intermixed. The spleen was unusually soft in its texture; but its coats were thickened in some places, having a ramified appearance of structure, of a tendinous firmness, and apparently of an intermediate nature between cartilage and ligament. The mesenteric glands were enlarged.*—*Morgagni*, xxiv. 18.

Case 2.

A man died in the latter end of June 1689. On examination the aorta was found to be ulcerated and ruptured near the heart, so that the pericardium was filled with coagulated blood. There was no dilatation of the artery.—*Valsalva*, xxvi. 7.

In other cases of rupture of the aorta which will be adduced, as well as in the one which has just been related, the parietes had been destroyed by ulceration.

In the following case the aorta was ulcerated as well as ossified, to a considerable extent.

Case 3.

An old country woman of a diminutive stature, and excessively thin, was said to have died of old age, after two days indisposition. But she had previously laboured under a difficulty of breathing

* From their resemblance to venereal wart-like productions, Corvisart suspected that the fungoid excrescences which form on the auriculo-ventricular and semilunar valves, had a syphilitic origin: but they have been found where there was no reason to believe that the patient had ever undergone any form of syphilis.—*Ed.*

and expectoration, though she had no cough. I only examined the abdominal viscera.

Dissection. The aorta from the diaphragm to the iliacs, was universally unequal from bony lamellæ; and a thick matter, of a brown and bloody appearance, adhered in some places to the internal coat, having been secreted by ulcers in that membrane; and this diseased state was continued into the coats of the splenic artery.—*Morgagni*, xl. 24.

It has happened, though indeed very rarely, that the coats of arteries have been affected with gangrene, whilst the surrounding parts were in a healthy state.—*Morgagni*, lv. 23.

Ossification of the aorta.

Case 1.

A woman about sixty years of age had constant difficulty of breathing, and occasional palpitation of the heart. She was unable to respire except with the neck erect; and experienced so urgent a sensation of constriction and anxiety in the region of the heart, that she often appeared to be on the point of death. The pulse never was intermittent, but the veins were large. She died early in March 1731.

Dissection. The thorax and abdomen contained some fluid, but there was none in the pericardium. The valves of the aorta were indurated, and one of them was ossified. Some places throughout the trunk of the aorta, on its inner surface, exhibited either bone or something verging to bone. In several parts it was unequal, and in others of a whitish colour, as it generally is when the process of ossification commences.—*Morgagni*, xxiii. 8.

It cannot be denied that the aorta, in this state, will resist the current of blood thrown into it from the heart; and on that account it will be adequate to create palpitation, difficulty of respiration, and that sense of straitness with which the woman was distressed. At the same time, it is necessary to advert to the numerous instances in which the aorta has been found in this state, whilst many of the patients did not suffer any of these affections, or at least, in an urgent degree. To explain this difference, other circumstances must undoubtedly be united with the disease in the aorta. There may be a diversity in the quality and quantity of the blood—in the state of the organs—or in that of the nervous system. With this condition of the aorta, an enlarged heart and dilated coronary arteries have been found, after there had been palpitation of the heart; and if the aortic valves are diseased, as they were in the preceding case, so that a portion of blood returns into the left ventricle, when it should receive the blood coming in from the lungs, it would happen that both the lungs and heart would sometimes be overloaded. Under these circumstances too, the heart will occasionally be excited to act with unnatural force. Two cases have been adduced by Vieussens, in which, after great palpitation of the heart, inequality of the pulse, and incapability of lying with the head low, the aorta and its valves were found ossified; and similar cases will be found in different authors: nevertheless, they do not all distinctly mention palpitation as having been a previous symptom.

The following case will tend to confirm the opinion, that ossification of the aorta is not uniformly accompanied with those symptoms.

Case 2.

A decrepit old woman having undergone an acute disease, was left with gangrenous sores; and was, at length, reduced to a most emaciated state, and ultimately to death. From the subsidence of the acute affection, her pulse was small and weak; and afterwards it became quick, but never intermittent or unequal. She had no palpitation of the heart, nor difficulty of respiration. She complained only of uneasiness in the præcordia. Her appetite was unimpaired.

Dissection. The abdominal viscera were in a healthy state. The inner surface of the fundus uteri was almost universally of that dark brownish colour which is common to gangrenous parts, and the surface was elevated by a small excrescence. The tubes were impervious to about the middle.

Within the thorax the aorta exhibited some white spots, and small scales: and the aortic valves were contracted, hard, and ossified; and were thickened at their edge by pretty large tubercles.—*Morgagni*, xxiii. 11.

It appears, therefore, from the observations of others, as well as from cases which have occurred to me, that palpitation of the heart, and intermission and inequality of the pulse, though generally arising from rigidity of the aortic valves, are not an invariable consequence of that lesion.—12.

I have already said that numerous cases had occurred to my friends in which, after sudden death, no morbid appearances were discovered which would account for it, except disease in the aorta. Sanctorini entertained no doubt that osseous bracteæ in this vessel were alone sufficient to destroy a man suddenly. He related to me six or seven instances, in which he could find nothing but these little bones to account for death. The most recent was the following case.

Case 3.

A Venetian tailor, devoted to hard drinking, but generally enjoying good health, had complained that he was not quite well; and soon afterwards, having eaten two little fish, and drunk some wine, he expired as he sat by the fire. The body was examined on the following day.

Dissection. The lungs were not perfectly healthy, and in the pericardium there was an excess of serous fluid But it was evident that the man could not have died thus from either of these causes; and as the heart and other viscera betrayed no morbid appearances worthy of observation, the aorta was opened from the curvature to the loins, and exhibited numerous scales; which were also observed, to some height, in both the carotid arteries. The stomach was exceedingly capacious, as it usually is in drunkards. The cæcum, to which there was no appendicula vermiformis, was contained in a hernial sac; and the orifice of the sac was three or four inches broad.

Morgagni, xxvi. 37.

Case 4.

Ossification of the aorta and coronary arteries; malposition of the gall-bladder; biliary calculi.

In an emaciated old man, whose body I dissected in December 1743, the pulse had been small and feeble, but not intermittent, when, in consequence of a strangulated hernia, he was brought into the hospital at Padua. Though I could not ascertain satisfactorily whether the pulse had been in that state previous to the coming on of this disease, or whether it was brought on by the disease, in conjunction with enteritis, yet the appearances observed on dissection render the case worthy of recital.

Dissection. On examining the external surface of the heart, the left coronary artery appeared to have been converted into a complete bony canal, from its origin to the breadth of several fingers, where it embraces the greater part of the basis of the heart: and that branch which it gives off upon the anterior part of the heart was ossified to the extent of three digits. The ossification was unequal, so that it resembled the knots of a slender reed. The tubercles of the aortic valves were indurated and almost bony. The internal surface of the aorta, from the origin of the upper arteries to the bifurcation of the aorta into the iliacs, was rendered uneven by bony lamellæ, many of which were equal in size to a man's thumb-nail. Yet I found the thin inner tunic of the artery, by which all these ossifications were covered, to be injured only in one place, at which a thickish matter had been secreted. There were bony scales, likewise, in the subclavian, carotid, splenic, and iliac arteries; but

the vessels within the cranium, and through the extremities, were not ossified, though in the limbs they were somewhat harder than usual. There were hydatids in the choroid plexuses, and some water in the ventricles.

The cartilages of the trachea and bronchia were ossified in several places, and instead of being in a curved line as usual, they resembled two sides of a triangle, which met and formed an angle anteriorly. It is not a rare occurrence for these cartilages, and those of the larynx, to become bony in old people.

The intestines were inflamed. The gall-bladder was situated transversely in the liver, and though of a natural size it had no corresponding depression in that viscus. It contained a small quantity of dark-coloured and viscid bile, in which there were twenty black calculi, and from their colour I immediately predicted that they would not inflame, nor indeed scarcely crepitate, when applied to the flame, which was verified by experiment.

Morgagni, xxiv. 16.

It is probable that there is some variety in the nature of the concretions spoken of, for though, amongst so many hard laminæ as I have seen in the arteries, I have not met with one that was friable, or that appeared to be constituted of sandy granules. However, I do not doubt that it might have happened to others; nor do I suspect the veracity of the same individuals who state that when they cast these lamellæ on the fire, they perceived no fetid odour like that which exhales during the calcination of bones, nor any blackness in them: but having made these experiments repeatedly myself,

I have observed both that odour and colour. Those that were thin and flexible resembled horn.

Haller and some other anatomists have spoken of the concretions in an aneurism of the aorta as *resembling* bone, and when I designate them bone, whether formed in the arteries or in other parts, I intend to express no more than similitude to bony structure, which they seemed to resemble in proportion as they were unlike stony or calculous concretions. I do not maintain that the same elegant structure is given to these morbid bones as to natural ones. No observations are extant of their being observed to be fibrous, nor is a fibrous arrangement observable in the dense and compact callus which unites fractured bones. Shall we, on this account, maintain that the callus is not of an osseous nature?—*Morgagni*, xxvii. 20.

The bony scales which form in the arteries do not exist in the inner coat, but are covered by it; and are often united with considerable marks of ulceration. In the case of the old man just related, at one part the annular fibres of the middle coat could be separated from the lamina without injuring them; yet in others the fleshy fibres appeared quite destroyed to the external coat. In another old man the vasa vasorum of the aorta were much distended, which is to be regarded as an evidence of permanent inflammation, and internally there were bony scales; but, in some places, the ulceration had not only destroyed the inner lining, but the middle fibrous coat of the artery was converted into a red and putrid substance. In the aorta of an old woman, the

ulcerated and ossified tract was distinguished by a thickish and bloody humour, which adhered to it as it escaped from the ulcerated parts. From these circumstances I do not doubt that bony squamæ are often formed after inflammation and suppuration; but they sometimes originate without any preceding inflammation, or, at least, without previous suppuration. In the eighteenth epistle a case is recorded, in which the aorta, from the heart to the origin of the arteries from its arch, was of an intermediate nature between ligament and cartilage, so that it could scarcely be cut into; and had the man lived it would have become bony: he could not have laboured under inflammation and suppuration to such an extent, without any symptoms of acute disease being observable. May we not suppose that in many of the bodies in which I found ulceration of the artery, that the ulceration had not always, and perhaps not often, preceded the formation of the bony scales, but had rather been the consequence of irritation from their prominencies and asperities?

Morgagni, xxvii. 22, 24.

But though ulceration of the aorta is more frequently met with when the coats are ossified, yet even then it certainly is not wholly attributable to irritation, for at times there is neither inequality nor roughness in the bones, though ulceration exists; and we have already shown, that ulceration occasionally takes place when the parietes of the vessel are exempt from ossification.—25.

The opaque spots which are the rudiments of ossification are usually situated in the cellular

tissue beneath the inner coat of the artery. This coat may occasionally be ulcerated where they exist, but usually it is spread over them, as it often is over the scales of bone both in the arteries and veins. In parts of the aorta which had become callous and yellow, Haller observed that there was a progression in the spots from softness to various degrees of hardness. In some it was of a pultaceous consistence, and in others coriaceous, in some cartilaginous, and in others bony. I have already mentioned instances in which there had been a soft matter deposited between the coats of the arteries, and which, in some parts, had been advancing to a firm concretion by the absorption of the more fluid parts; but, in many instances, I never could find any thing like fluid, nor any variation of consistence.*—27.

The aorta has sometimes exhibited a reticulated texture internally, as well as conversion into bone.—liii. 37.

Various other cases of ossification and ulceration will arise when describing diseases with which they were complicated.†

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* See an interesting case by Jano Planco, page 434.

† A cartilaginous or osseous induration of the aortic valves is perhaps the most frequent lesion to which the heart is liable; and it will at once be admitted that no disease of the arterial system can threaten more serious consequences. Sometimes the induration commences in the corpus Arantii, and that body then proves a nucleus from which the ossification extends upon the floating edge of the valves; but most frequently the deposition of osseous matter takes place at the base of the valves, between the two membraneous folds of which they are formed; but as accretion goes on, the lining membrane is absorbed, so that the

Ossification of the pulmonary artery.

It has been shown that sometimes when there is disease in the mitral valves, palpitation of the

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calcarious matter appears to be completely on the surface of the valves. When this change has taken place in the valves, they seldom remain applied to the surface of the artery, but most frequently, according to Corvisart, there is a curling or retraction in them, so that they appear somewhat irregularly fallen down. The principal effect, of course, is to occasion a contraction of the mouth of the aorta, so that sometimes it leaves merely a fissure for the passage of blood; and occasionally the orifice is nearly obliterated. Corvisart has related an instance in which the valves were not only indurated and ossified, but thickened by the deposition of calcarious matter between the folds, and their free edges approached so as to touch each other. Had not the base of one of these valves preserved sufficient pliability to perform a kind of seesaw motion, which augmented, by a line or two, the opening for the passage of blood, it would have had to pass out of the ventricle by an exceedingly narrow slit.

The degree and nature of the induration of the valves present considerable diversity, and in the greater number of instances the internal membrane of the aorta, contiguous to the valves, participates more or less in the disease. We may often wonder how life has been preserved for some years under the degree of obstacle to the circulation which had existed; and we are reminded of what has already been referred to, namely, the principle of adaptation to diseases of slow formation.

So frequently do the coats of the aorta become the seat of these calcarious depositions, that Bichat estimates their existence in seven out of ten subjects above the age of sixty; and Dr. Baillie believes that they are more frequently found at that age, than that the arterial system should possess a healthy structure.

When the orifice of the aorta is obstructed by disease in the valves, strong and frequent palpitations usually take place, because the heart fills with ease, but empties itself with difficulty, so that blood is delayed in the left cavities. "The pulse," says Corvisart, "may preserve a certain degree of hardness or stiffness, but never much fulness or regularity." Sometimes, however,

heart and intermission of the pulse do not immediately follow. When other obstacles nearer to

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very extensive depositions of calcareous matter take place without irregularity of the pulse. I have before me the heart of an octogenarian who died under symptoms of hydrothorax, and whose toes had sphacelated; but though the pulse had been quick and vibrating, it had not been intermittent or irregular. Two of the aortic valves are nearly covered with a thick and horribly rugged deposition of bony substance, and more than half the third is in a similar state. The aortic fold of the valves is destroyed. The root of the aorta is rather wide, and pervaded by osseous substance, some of which lay open to the current of blood, but patches, in other parts, were still between the coats of the vessel. The coronary arteries are a complete bony canal. Those extremities of the chordæ tendineæ of the mitral valves which are united with the carneæ columnæ, are in a state of incipient ossification; and behind the mitral valves, in the auriculo-ventricular aperture, there is a very considerable accumulation of phosphate of lime. The parietes of the left ventricle were thickened, and the capacity of the cavities on this side was augmented.

Angina pectoris has been ascribed to a degeneracy of the muscular structure of the heart, in consequence of ossification of its nutrient arteries. I have met with a few cases, however, in which a large portion of calcareous matter had been deposited between the coats of the coronary arteries, so that in two cases they were nearly obliterated, yet the muscular substance of the heart was firm and healthy. These, however, should only be regarded, perhaps, as exceptions to what many eminent men have regarded as the pathology of the disease.

The arteries are not only liable to obstruction from calcareous and other depositions within their coats; and they are sometimes obliterated by lymph. During the sloughing of contiguous parts of a limb, coagula have so effectually plugged the arteries that no blood has flowed on amputation. A remarkable case is related in the fifth vol. of the Phil. Trans. abridged, in which very little bleeding ensued after amputation of the thigh, " because the arteries and veins, which were eaten asunder by the mortifying

the right cavities of the heart arise, inequality of pulse is not likely to ensue; but, frequently, there is palpitation. The distinguished Chomel remarked that a man whose pulmonary artery was ossified internally and externally, and whose heart was very much enlarged, had been annoyed by frequent palpitations: but in a maiden dissected by Valsalva, although the valves at the entrance of the pulmonary artery were so united together as scarcely to leave an aperture equal to the diameter of a lentil, so that blood was delayed in the right cardiac cavities, which had become dilated, yet palpitation was not observed among the symptoms.*—*Morgagni*, xxiii. 14.

Aneurism of the aorta.

Those cases of this disease will be first adduced in which the vessel was merely dilated; and afterwards those in which the aneurism had ruptured. A peculiar interest attaches to the first case, from the circumstance of its having occurred in the person of Anthony Ferrarini, one of the first physicians at Modena. I have collected the particulars from the papers of Malpighi, whose

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matter, nature had closed again." Morgagni has alluded to an instance in which the large pulmonary vessels were found completely divided, though there had been no hæmorrhage. See page 335. It is probable that, during the destruction of the viscus, its vessels were secured in the manner to which I have adverted. During inflammatory action the vasa vasorum also may effuse coagulable lymph. Mr. Hodgson has recorded one instance, in which the femoral artery and profunda were obliterated by fungoid excrescenses similar to those which form on valves.—*Ed.*

* Vide page 375.

advice Ramazzini sought by letter from the commencement of the disease.*

* Aneurisms have been divided by systematic writers into three species; namely, true, spurious, and mixed. By the first appellation is understood a dilatation of all the coats of an artery; by the second those cases are referred to, in which one of the coats are ruptured, while the other coats, or only the cellular one, have undergone dilatation; the term *mixed* is applied to that variety in which the coats of the vessel are dilated to a certain extent, and, subsequently, by their destruction, the true aneurism was converted into the spurious. Corvisart entertained the opinion that the greater number of aneurisms of the aorta appertain to the first species, though some are nearly allied to the false aneurisms. Scarpa, however, appears to have held the opinion, that aneurism is always produced by a destruction of the coats of the artery; and Mr. Hodgson, who, having rendered himself familiar with the labours of his predecessors in this important track of pathological inquiry, greatly added to that knowledge by examining a multitude of preparations of this disease; and he acknowledges that a great proportion were formed in the manner described by Scarpa, namely, by a destruction of the internal and middle coats of the artery, in consequence of their rupture, and the expansion of the external or cellular coat into a sac. The destruction of these coats by ulceration is a less frequent cause of aneurism. "When the internal coat," says Mr. Hodgson, "has undergone the steatomatous and cartilaginous thickenings, "or when calcareous matter is deposited in its substance, it "frequently cracks and hangs in scales into the cavity of the "vessel. The disease is sometimes so extensive, that the middle "coat becomes involved in it; the fissure extends throughout "its substance, and the fibres are readily extended by the "impulse of the circulation. The blood thus comes in contact "with the external coat which is dilated into a sac, in the same "manner as when the internal and middle coats are destroyed by "ulceration."

It is a curious fact, that the sudden laceration of the internal and middle coats of a healthy artery, or the forcible peeling off of the external coat, so far from being followed by aneurism,

Case 1.

Aneurism of the aorta.

Anthony Ferrarini, of a melancholic temperament, and with a disposition to cachexia, constantly spat a large quantity of saliva impregnated with acrid salts. During twelve months he had been annoyed with violent and almost ceaseless cough, united with some difficulty of breathing, especially when ascending an acclivity. About the end of August 1689, he was suddenly attacked in the middle of the night, with such oppressive anguish at the chest that he expected immediate suffocation: nevertheless, by expectorating a considerable quantity of mucus, the agony ceased. But after an interval of two days, when evacuating the intestines, he was seized with a similar paroxysm, though in a mitigated degree; and subsequent to that seizure, he was constrained to respire with the neck upright. He experienced

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is actually productive of greater firmness in those parts, in consequence of an effusion of lymph.

All aneurisms, however, are not formed by the destruction of the inner and middle coats; for, in consequence of some previous lesion of their texture impairing the elasticity of a portion of the vessel, it sometimes gives way, and there is a partial dilatation of the three coats into an aneurismal sac. I conceive that we may safely drop the division of aneurisms into species; but we cannot understand the pathology of the disease without being aware that it often presents a diversity of structure, though generally preceded by the same deviation of the parietes of the vessel from the natural state.

The deposition of calcareous matter is sometimes so extensive, that the parietes of the sac have appeared to be constituted of osseous substance. An interesting case of this nature has been related by Mr. Liston, in the Ed. Med. Journal for January 1821

Ed

considerable temporary relief from the loss of blood. He was often watchful, and sometimes had a most troublesome dry cough; but a sensation which resembled that of a cord binding the trachea peculiarly distressed him, though he regained ability to assume the recumbent position occasionally. He became emaciated, and the paroxysms augmented in frequency and violence; but his pulse did not indicate fever. Blood was withdrawn from his foot, and by this depletion his strength was reduced, and the disease appeared to be aggravated. He was now attacked with the same oppressive agony more frequently, and it was accompanied with a sense of constriction in the trachea and fauces. Indeed it was not uncommon for him to be thus affected three or four times a day. Each incursion lasted for two hours, and was so violent in degree as to threaten instant suffocation; but these urgent symptoms were subdued by general and copious perspiration. An attempt to swallow, or even to receive an enema, reproduced the paroxysm. When exonerated from these symptoms he experienced neither pain nor uneasiness, excepting a moderate difficulty of breathing, and a sense of flatus ascending from the hypochondria to the fauces. The latter circumstance, with the sudden invasion and cessation of the paroxysms, the relief obtained by the eructation of wind, and also the melancholy temperament of the patient, induced not only the sick physician himself, but most others, to think that the paroxysms were ascribable to an affection of the nervous system similar to that which produces hysteria in women. About the seventieth

day from the first attack, the patient's life yielded to the violence of disease; and during nearly the whole of the time which has been mentioned, he was under the necessity of sitting up in bed or in a chair, with his body bent forwards, on account of the difficulty of breathing.

Dissection. The abdominal viscera and the lungs were apparently in a natural state.

In the aorta, as it ascended from the heart, there existed a large aneurism, from which upwards of a pound of blood was taken.—*Morgagni*, xviii. 17.

The solicitude for a posture in which the body was inclined forwards, indicated compression on the aspera arteria, and showed that it was somewhat removed by this position. In a case which occurred to Reiselius, of a boy whose heart was greatly enlarged, considerable relief from the sense of constriction was obtained, by leaning the head and thorax upon a bench whilst he stood. This alleviation probably arose from the pressure of the heart falling upon the sternum rather than upon the lungs, which it would affect in the supine posture. In other instances of dilatation of the heart, the same inclination of the body has been found the most easy position. Friend observed it in a case of aneurism of the aorta.—18.

The relief obtained by inflection of the body has been experienced in other diseases besides aneurism. Capperus observed a man breathing with great difficulty, and who was compelled to sit with his body so bent, that his head was almost between his knees, yet he had no aneurism; indeed the other signs of this disease were not apparent, and he was

evidently labouring under phthisis. It is proper to remark that a tumour in the thorax has produced some of the symptoms of aneurism. The existence of the disease must not be determined by one or two of the ordinary phenomena which indicate it; most of them ought to be regarded, to avoid deception.

During certain passions of the mind, the circulation of blood through the lungs is often powerfully excited, and sometimes as forcibly retarded, which the face, respiration, and pulse clearly demonstrate. We cannot therefore be surprised if from violent efforts to suppress or conceal indignation, aneurisms of the heart and aorta should originate. Such is the power of human passions in dilating the channels and receptacles of blood in the thorax, that Albertini justly deduced an argument from the absence of this influence in brutes, to account for these dilatations being so rarely found in them, and so often in the human subject.

When, therefore, these, or any other probable causes have preceded—when most of the symptoms which usually characterize the disease are present—when there are no indications of other diseases in the thorax—and when the effects of remedies are considered—we may be prepared to conjecture that aneurism exists.—19.

The absence of pulsation, as in the case just related, and in numerous others, is a circumstance which has misled many physicians. There may be pulsation independent of aneurism of the artery, and aneurism may exist without pulsation. Sometimes it is very obscure from the commencement;

at others it ceases in its progress owing to coagulation of blood in the sac; so that even in large external aneurisms no pulsation whatever may then be perceived. In a large aneurism of the thoracic aorta, beginning about three digits above the heart, Ruysch has mentioned that for some time before death, the pulsation was obscured from the quantity of laminæ of coagulated blood.—20.

The following case coincides with the preceding in the nature and seat of the aneurism, and the uneasiness occasioned by deglutition; but here the arteria innominata was involved in the dilatation.

Case 2.

Aneurism of the aorta and arteria innominata.

A trumpeter at Padua had been affected with an aneurism of the aorta which occupied the upper part of the chest, long before I saw him, which was, I think, about the year 1723. In proportion as the expansion of the artery increased, the uneasiness in deglutition, and the difficulty of breathing, were augmented, till at length he became entirely incapable of swallowing, and afterwards of breathing.

Dissection. I found the arch of the aorta, with the arteria innominata, so dilated, that the aneurism had compressed the trachea and œsophagus. Its inner surface was occupied by a thick laminated concretion, which I had observed in other instances, Its curved laminæ could be separated from each other like those of an onion: it was hard, of a yellowish white colour, and bore a stronger resemblance to hardened suet than to

any thing else with which I could compare it.*—*Morgagni*, xviii. 22.

The disease, I thought, in this case, was attributable to frequent and strong inflation of the lungs; for whatever interferes with natural respiration disturbs the circulation of the blood, so that sometimes it is excited and at others obstructed. Hence persons who habitually use wind instruments, or who are subject to violent cough, are very liable to aneurism.

By comparing the observations of various authors with those which have occurred to me, I find that at the curvature of the aorta, or very near it, aneurisms of this vessel are usually found. The blood is driven into this part from the left ventricle with greater impetus, and is proportionately repelled by the curve, when the vessel contracts, into the contiguous parts of the vessel. But the blood is more easily received into the descending aorta than into that portion which ascends from the heart, because it is shorter, has no branches, and is closed by the semilunar valves; and therefore aneurismal dilatations are more liable to happen between the curvature and the heart, than in any other adjacent part. Aneurisms are much less

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* Mr. Armiger has related an interesting case of dysphagia from aneurism of the descending aorta. The aneurism ultimately burst into the œsophagus, at about two inches from the diaphragm. There had been considerable difference in the pulsations of the two radial arteries. In the left wrist they varied in frequency from 90 to 100, and were the smallest and weakest; in the right wrist they were 100 to 110 in the minute.

Med. Chir. Trans. vol. ii.—*Ed.*

frequently discovered in the pulmonary artery than in the aorta, though it appears to be no more capable of resisting the action of the right ventricle than the aorta is adequate to sustain that of the left. This comparative infrequency must be referred to the position of the artery.—*Morgagni*, xviii. 24.

Case 3.

Aneurism of the aorta, occasioning the absorption of the ribs.

The subject of this case was a native of Beluna, about fifty years of age, who was a shearer of woollen cloth, and who had been affected with the venereal disease. About a year before I saw him, he began to perceive a tumour in the right and upper part of the chest, and when I did see him he complained of great difficulty of respiration whenever he walked or spoke; but it did not attack him by paroxysms, nor had he either a sense of suffocation, or sudden interruption of sleep. He was only able to eat and drink sparingly, though previously he had been greatly addicted to excess in drinking. His face was tumid, and of a brownish red complexion; his voice obscure and hoarse; the sputum thick; the tumour was occasionally observed to pulsate: indeed, before the last twenty days, the pulsation was evident at a distance. The early part of the night, in which he died, he had passed as usual, amongst his fellow servants, and retired to bed saying that he should soon fall asleep, but he was found, shortly afterwards, breathing with stertor, and foaming at the mouth; and in about four hours he expired.

Dissection. The face of the corpse was tumid and of a dark colour; the preputium and glans penis were swollen and livid, and exhaled an odour which indicated an approach to gangrene. The liver and spleen were indurated, and the latter was somewhat enlarged.

On the exterior part of the thorax, between the right axilla and the sternum a tumour existed which was of a hemispherical figure, though somewhat depressed. It extended from the fourth rib to the clavicle, and yielded to pressure, so as to indicate that scarcely any bones or cartilages remained. The clavicle was displaced and carious, and the portions of the four upper ribs, which usually are cartilaginous, were destroyed. This destruction had been effected by an aneurism larger than the head of a kid: its figure was nearly oval, and it extended from the base of the heart to the upper part of the thorax. The aneurism resembled a sac, the left side of which communicated with the right side of the aorta, before it gave off the arteria innominata, by a foramen large enough to admit two fingers. The sac appeared to be formed by a production of the parietes of the aorta; but in the aneurism these parietes were of whiter colour, more tenacious and dense, and not thinner than the coats of the artery. The sac was invested by numerous curved laminæ of a fibrous texture; and within this circumference so large a quantity of grumous blood was contained, that when it was removed from the sac, with the lamellar concretions, it weighed forty ounces. The aneurism, by its bulk, had pressed the right lung backwards and

downwards; and when this lung was cut into, a purulent fluid escaped from the divided bronchia. There was an accumulation of yellowish serum in each thoracic cavity, and some flakes of lymph floated in the liquid. The pericardium adhered to the heart by a layer of coagulable lymph. The internal coat of the descending aorta had acquired a sort of tendinous hardness.—*Morgagni*, xviii. 25.

Although there were many circumstances in this case likely to produce suffocation, it is probable that the immediate cause of death was of an apoplectic nature; for the aneurism was so situated that it might compress the trunk of the superior vena cava, especially when the patient assumed the decumbent position, and perhaps he lay on the right side. It is not improbable that he had drunk a greater quantity of wine than usual, and thus the turgescence of vessels might have been increased.

The stertor, foam at the mouth, tumid and livid face, which accompanied his decease, sanction the supposition of increased distension of the sac, and also of remora of blood in the head.—26.

The destruction of bones, by the pressure of aneurisms, is a circumstance which often occurs. The small vessels of the periostium, and other vessels of that nature, (for instance, of the pleura) being placed between those resisting bodies and the aneurism, are injured by its continual and strong pulsations; and the small vessels in the parietes of the aneurism sustain a similar lesion.

I have often found marks of ulceration in the coats of arteries, especially those of the aorta,

when the constitution has been affected with lues venerea.—27.

Aneurisms of the aorta sometimes present the appearance of an almost equal dilatation of the artery; at others, as in the preceding instance, one part of the artery gives way, and the aneurism is a kind of sac. I possess four specimens of aneurism that were stuffed and dried by the celebrated Vulpius, all of which are either in the arch of the aorta or in the space between the heart and that curvature; and three of them are of the latter species.*—37.

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* In several of the ensuing cases the disease presented that form of preternatural and equal dilatation to which Morgagni has adverted. But Scarpa, Hodgson, and other writers on this subject, distinguish that uniform expansion of the coats of the artery from aneurism, though, like that disease, it is often combined with disorganization of the coats of the artery, and sometimes with a genuine aneurismal lesion. It is most frequently observed in the ascending portion, and the arch of the aorta, and sometimes takes place to an almost incredible degree. The morbid alteration in the coats of the vessel which precedes and accompanies this dilatation, is usually either thickening, or a deposition of atheromatous or of calcareous matter: but sometimes, though indeed very rarely, the dilatation exists without a perceptible lesion of texture, and has arisen from a contraction in a more distant part of the aorta. Though it is most common, as already observed, in the ascending portion of the aorta, it is often seen in the farther course of that artery, and at the angles where the arteries divide. Sometimes the dilatation in the vessel takes place only on one side, where it expands into a sort of pouch greatly resembling an aneurism. These dilatations seldom contain lamellated concretions. I have not thought it necessary to disjoin these cases from those strictly aneurismal; indeed, in some of them, the distinguishing characters were not very obvious.—*Ed.*

Syncope occasionally arises from aneurism of the aorta, of which the following case affords an example.

CASE 4.

Dilatation and disorganization of the aorta, with excrescences on the mitral valves, and disease in the sigmoid: spleen softened.

A poor and rather emaciated woman, apparently about fifty years of age, twelve months before death was affected with syncope, to such a degree that she was supposed to be actually dead. After that time she underwent several other attacks, and was ultimately found dead in bed. This circumstance happened in the year 1726, and the body was sent to the anatomical theatre.

Dissection. The abdominal viscera presented no appearances worthy of observation, except that the spleen was of a small size, and internally was nearly of a fluid consistence.

The left lung was united with the costal pleura in several places. Both the valvulæ mitrales, near their edges, were rather thick and indurated; and they exhibited a series of rather large globular bodies, which, when cut into, evinced a tendinous structure. The adjacent semilunar valves also, were thicker than usual, and one of these had its corpusculum Arantii enlarged, and adherent only by a very small portion. The aorta, immediately on going off from the heart, was dilated; and near the orifices of those branches which proceed from the arch, the inner surface of the artery was unequal, and so flaccid that the yellowish membraneous laminæ could easily be pulled away with

the finger. The pulmonary artery appeared larger than its usual size. Wherever the parietes of the heart were cut into, they exhibited sections of a cineritious colour, tending to a brown and livid hue; but it must be stated that this viscus, and the head, were not dissected till the thirteenth day after death, though, indeed, it was in the winter season.

Although when the head was divided from the trunk, no inconsiderable quantity of serum flowed from its cavity, yet a large quantity was found beneath the pia mater, and also in the lateral and third ventricles. The fluid was quite limpid; and the choroid plexuses were generally of a pale colour: but in the middle they were black from congestion of blood, and their vesicles were distended with serum. Through the cerebral substance, the blood-vessels were more distinct than usual; and in some places those of the pia mater were in a state of plethora. The coats of the carotid arteries, at the basis of the cerebrum, and those of the basilary artery, were indurated: the latter were of a yellowish white colour; and, when opened, presented an unequal surface. This appearance convinced us that the disease which we had seen in the aorta had extended, through some of its branches, quite to the cranium.

Morgagni, xxv. 10.

Case 5.

Dilatation of the aorta and of the pulmonary vein; the liver and spleen diseased; central contraction of the stomach.

A lady forty-two years of age, who for a long time, had been a valetudinarian, and within the

same period, on using pretty quick exercise of body, she was subject to attacks of violent anguish in the upper part of the chest on the left side, accompanied with a difficulty of breathing, and numbness of the left arm; but these paroxysms soon subsided when she ceased from exertion. In these circumstances, but with cheerfulness of mind, she undertook a journey from Venice, purposing to travel along the continent, when she was seized with a paroxysm, and died on the spot. I examined the body on the following day.

Dissection. The face was somewhat livid. Having suspicion of an aneurism at the arch of the aorta, the dissection was commenced at the thorax. The cavities of the chest were occupied by a considerable quantity of a bloody serous fluid, and the lungs themselves contained a redundance of frothy serum. The heart was not only somewhat augmented in bulk, but was very hard and strong. The aorta was considerably dilated at its curvature; and, in places, through its whole tract, the inner surface was unequal and ossified. These appearances were propagated into the arteria innominata. The aortic valves were indurated. The trunk of the pulmonary vein was somewhat larger than it usually is. The small intestines were of a blackish red colour, and the stomach was divided into two portions by a central contraction, The liver extended very far towards the left side, and the enlarged portion was indurated, and of a more saturated colour than is natural to this organ. There was some induration of the pancreas; but the spleen, on the contrary,

was so flabby that its texture could be broken down by the finger. The ovaries were contracted, the os uteri was dilated, and the fundus of this viscus was somewhat inflamed.

Morgagni, xxvi. 31.

The contraction of the stomach, I presume, was congenital. In the aorta there were several causes to which the sudden death may be referred. The inequality of the surface, would, in a measure, impede the current of blood; and with this, the bony lamellæ, the rudiments of ossification, and the dilatation of the vessel, would concur. During a quickened motion of the body the circulation of blood would be accelerated, and under the progressive increase of disease, the artery, at length, would become incapable of propelling the blood. The delay of blood in the aorta, in the heart, in the pulmonary vessels, and the vena cava, would occasion the symptoms of which the woman complained during life; namely, the violent uneasiness, the difficulty of breathing, and the numbness of the arm.—32.

It will appear from some of the preceding cases, that sudden death sometimes takes place from aneurism without its rupture; but we shall now proceed to those cases in which life continued till the aneurismal parietes gave way.

Case 6.

Dilatation of the aorta; the lacteals enlarged.

A vivacious man seventy-five years of age, of a sanguineous temperament, tall, and possessing a good constitution, became greatly emaciated some

years before his death, but especially in his last years. He experienced oppressive pain in the left division of the thorax, which was relieved, however, by eructation of wind. In the beginning of his last winter, this uneasiness became more severe. He had a troublesome cough, with which he sometimes expectorated a serous, and, at others, a globular and dense matter. Accelerated motion always occasioned difficulty of respiration, accompanied with pain in the thorax, and sometimes, with palpitation at the heart, which obliged him to stand still. On the third of January he was affected with deliquium animi, copious hæmoptysis, and urgent dyspnœa. At the beginning of the night these symptoms were mitigated by bleeding, but there remained a pungent pain in the left side, and when he attempted to lie down on that side he experienced great uneasiness. His pulse was feeble, slow, hard, and vibrating, but not often unequal. Four hours afterwards all these distressing symptoms were renewed; the stertor was extremely sonorous; and the sputa were of a white colour, streaked with blood. He died at the expiration of about six hours from that period.

Dissection. As soon as the left side of the thorax was punctured, a serous fluid burst forth, and this cavity was found to have been filled with serum and coagulated blood: but the right side was exempt from disease. In the pericardium there were three ounces of a serous fluid, and the ventricles of the heart contained some grumous blood. The aorta, from the heart to the diaphragm,

was dilated into an enormous aneurism; but the dilatation was not uniform in degree. The aneurism adhered most tenaciously to the fourth and fifth dorsal vertebræ, which seemed to be a little curved to the right side; and near these vertebræ, the expanded vessel had burst, and discharged its blood, by a large fissure, into the left cavity of the chest. The circumference of the foramen was ulcerated; and about it there were firm concretions hollowed out into a kind of tube.

There were no morbid appearances worthy of observation in the abdomen, except on the right kidney, the upper half of which was converted into a bladder containing about three ounces of serum, which, on evaporation by heat, exhaled a urinous odour. The parietes of this vesicle were thin and highly vascular; and the vessels became extremely conspicuous by injecting them from the emulgent artery. As the lacteal vessels arose from the small intestines, from about eight digits below the pylorus to the distance of two ells, and passed to the centre of the mesentery, they presented the appearance of numerous whitish spots, having a diversity of figure and magnitude; some of them were equal to the size of a lentil, and a few twice that size; but others were smaller. They were turgid with chyle, which tasted like milk, though inclining to a saltish flavour.

Valsalva, xvii. 14.

It is probable that the thoracic duct had been compressed by the bulky aneurism, and consequently the transmission of chyle through that canal had been interrupted, so that its vessels

were dilated into varices: or lacunæ, which are not visible in the natural state, had become enlarged.—*Morgagni*, 15.

Temporary relief is often obtained by eructation in these cases, but the physician should not be misled by this circumstance. The stomach, and the inferior part of the œsophagus, being distended by flatus, the uneasiness increases till the wind is expelled. It is remarkable that he should have survived the rupture ten hours, which perhaps is attributable to the orifice being repeatedly closed by coagula.—16.

Case 7.

Aneurism of the aorta; one vertebra absorbed.

A man who was usually occupied as a waggoner, or in riding post, fifty-five years of age, of a diminutive stature, and very salacious, about ten years before his death, became the subject of various diseases, such as fevers, diseases of the spleen, cachexia, and dropsy; but during the last year of his life he obtained an emancipation from these diseases, though his skin retained a yellow complexion, and his respiration was difficult. The symptoms which have been distinguished were aggravated by motion, and were conjoined with a sense of agony at the heart. The arteries of the neck and of the temples had an evident throbbing action; the pulse was hard, rather slow, and vibrating, but never unequal or intermittent; he could lie on either side; he often coughed, and expectorated a little serous humour. The blood which had been withdrawn exhibited a buffy coat, which was three

digits in depth, whilst the subjacent red portion did not exceed two. After this he was occasionally seized with syncope. He progressively became worse, and on the latter days of his life his face was greatly swelled. At length, whilst carried from one bed to another, he suddenly expired.

Dissection. The intestines, anteriorly, were adherent to the omentum, and laterally, the convolutions were united to one another. The other abdominal viscera were firmly connected to the contiguous parts.

The pleura pulmonalis adhered to the costal pleura, and on the left side to the mediastinum and diaphragm also. The bronchial glands were enlarged. The coats of the aorta were indurated, and beset internally with bony scales; and they were also dilated into an aneurism three digits in breadth and a span in length. At about the fourth dorsal vertebra the dilatation was greater; and the body of this vertebra was hollowed out, and its place occupied by the aneurism. The union between the aneurism and the bone was so firm, that they could not be disjoined without laceration. A coagulum, which originated in the left ventricle of the heart, extended into the aneurism. There was an accumulation of serum in the left cavity of the thorax, and it contained a large coagulum of blood, which probably had escaped from the aneurism, though no trace of rupture was discovered.—*Valsalva*, xvii. 17.

Perhaps in no description of persons have my friends or myself seen aneurisms of the aorta more

frequently than in guides, post-boys, and others who ride almost continually on horseback.*

Morgagni, 18.

Case 8.

Laceration of the aorta and pulmonary vein; calcareous concretions in the lungs.

A man forty years of age, possessing a good constitution, three or four years before death, began to complain of his respiration being difficult, especially after violent exercise. About three months preceding the fatal termination, a tumour began to arise on the left side of the neck, which was hard, unattended with pain, and was supposed to be of a sarcomatous nature. By gradual enlargement it acquired the magnitude of two fists, and the figure of one placed upon another. He was received into the hospital of St. Mary de Morte, when his strength decreased, and febrile symptoms arose. The pulse was sometimes quick, and hard, and occasionally it was unequal, both in relation to the order and strength of its action. The head was exceedingly painful, and the mind slightly delirious. The function of respiration became more deranged, accompanied with stertor, and some pain in the thorax. Deglutition became difficult, and at length was wholly impeded; his face, and indeed the whole head, acquired an excessively red appearance, and on the seventeenth of December 1688 he expired.

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* An experienced surgeon of a regiment of cavalry recently confirmed this observation of Morgagni. He informed me that he had found horse-soldiery peculiarly liable to aneurism of the aorta.—*Ed.*

Dissection. The tumour, which during life had been hard, was now flaccid, and was found to be filled with blood, part of which was grumous and the remainder fluid. The adjacent glands were greatly indurated, and compressed the œsophagus and jugular vein; and the parietes, both of the vein and of the gullet, were thickened. The larger trunk of this vein and the aorta were lacerated.

The surface of the lungs was diversified with black spots, and in the texture of these organs some globules of calcareous matter, and a large quantity of serous fluid, were discovered.

Valsalva, xvii. 19.

Valsalva has not been sufficiently explicit in this case, but when I considered the protracted difficulty of respiration, especially after violent motion, I regarded it as an instance of aneurism of the aorta. The period of his admission into the hospital, when the tumour was particularly noticed, accounted for pulsation not being observed. The aorta by dilating upwards was, I believe, the occasion of most of the symptoms which had been noticed—the pressure upon the trachea and larynx would tend to impair the voice—and the compression of the pharynx and œsophagus rendered deglutition, at first, difficult, and as the disease advanced, totally obstructed the canal. The internal jugular vein being submitted to compression, the return of blood from the head was interrupted; and from this circumstance the pain of the head, the redness of the countenance, and the wandering of intellect arose.—*Morgagni*, 20.

In the following case there was no symptom

which denoted the aneurismal affection, except a pain in the chest.

Case 9.

Dilatation of the aorta; bones absorbed.

A middle-aged woman, who had been in the hospital at Padua before, on account of pain in the left division of the chest, presented herself again for admission, previous to the middle of January 1717. She complained of the same pain, and it was accompanied with considerable fever, and vibration of the pulse. The disease was evidently urgent, but the symptoms did not indicate such imminent danger as to induce a suspicion that a fatal termination was so near: nevertheless, she died suddenly on the following day.

Dissection. When the thorax was opened, it appeared as if she had laboured under hydrothorax; but as a large quantity of coagulated blood was found below the serum, the nature of the case was clearly defined. Proceeding in our inquiry as to the source of the extravasated blood, a large and ruptured aneurism of the aorta discovered itself. From its origin this artery was wider than it is in its natural state, and its inner surface was uneven; but it was not manifestly dilated into an aneurism before it had sent off the subclavian artery. From this part the coats of the artery were not extended into a lateral sac, but the trunk expanded itself uniformly, so as to form a large and almost spheroidal cavity. At the lower part, the artery again contracted to its usual diameter. The aneurism on one side had compressed the upper portion of the left lung, and on the other it pressed upon the

bodies and lateral processes of the vertebræ, and the contiguous extremities of the left ribs, and these bones were extremely excavated, though not to the spinal canal. The lungs were consolidated where they were conjoined to the aneurism, and were so closely agglutinated to it, as to supply the office of the arterial coats, which had been destroyed to an extent of two digits. There was no shell of concretions within the aneurism, but the structure of the parietes was so tender that it could easily be pulled away in scales.

Both the ovaria were black, and the left was hard, and partly filled with half-coagulated blood. They were united with the Fallopian tubes, and had some hydatids upon them of different sizes: one of them on the left was particularly large, and this, with numerous others on the same ovary, would have contained four ounces of fluid. The tubes were impervious; and the cervix uteri was pervaded by some dark yellow mucus, of a tenacious consistence. The glandular substance of the mammæ contained serum which in some places was of a green, in others of a black colour; but the texture appeared to be healthy. There was fluid in the spinal canal.—*Morgagni*, xxi. 47.

It should not excite surprise that whilst the aneurism had hollowed out the bones, the much softer texture of the lungs, and the medium of agglutination in the circumference of the ulcer, were not destroyed. A case occurred to Maloet, in which, though an aneurism adhered to the trachea, so that the cartilages of this tube constituted a portion of the aneurismal parietes, as the

lungs did in the preceding case; yet the impetus of the blood which had effected the partial absorption of these cartilages, had not destroyed the adhesion, nor occasioned the ulceration of the much softer and thinner parietes of the aneurism. Those parts which yield to the impulse certainly sustain less injury than those which strongly resist it. The same immunity from lesion has happened to the pectoral muscles after the ribs have been destroyed. A case has been related by Schreiberus, in which a large aneurism of the aorta, under the pectorales muscles, was so ruptured that the aperture would admit the fist, and three of the ribs had been absorbed; but though the lungs were pressed back their structure was uninjured; nor was the diaphragm, though connected with the aneurism, or the pectoral muscles, at all disorganized.*—48.

In the following case the sternum and bones connected with it were rendered carious by the continued action of the aneurism.

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* Morgagni, in common with other pathologists who preceded him, or who were his cotemporaries, believed that the bones became diseased and destroyed not only by the impulse of the aneurism, but, in a great measure, by the influence of an acrid secretion from the surface of the aneurism. But the destruction of those solid parts is now chiefly ascribed to absorption; and it has been supposed that cartilage is not so liberally supplied with absorbents as bone, from the circumstance that when cartilage and bone have appeared to be equally subjected to the pressure and impulse of the dilated artery, the latter has been the more rapidly destroyed—*Ed.*

Case 10.

Aneurism of the aorta; bones destroyed.

A man in the habit of playing at tennis, and greatly addicted to wine, was seized with pain in his right arm, and soon afterwards it invaded his left, accompanied with fever. On the upper part of the sternum, at length, a tumour arose, which resembled a large boil, and some ignorant surgeons, who did not observe the pulsation, were deceived respecting its nature, and prescribed some violent applications to promote suppuration. The tumour daily augmented in size, and when the man came into the hospital of Incurables at Bologna, in 1704, it was as large as a middling-sized quince, and from one spot blood began to exude. The man being quite ignorant of the imminence of his danger, had nearly broken through the extenuated skin when removing the bandages, but being warned of the peril he was desired to maintain the utmost quietude, and to meditate seriously and piously upon his departure from this life, which was inevitably near. On the following day the predicted effusion of blood took place, when he commended himself to God, and held a basin with composure to receive the blood, till the attendants came to his assistance, and in their arms he soon expired.

Dissection. There was no longer any external appearance of a tumour, for after the hæmorrhage the aneurism had subsided, and the aperture was capable of admitting two fingers. The integuments of the thorax, and of some parts of the lower limbs, were anasarcous, and both cavities

of the thorax contained a large quantity of a yellow serous fluid. The anterior part of the arch of the aorta was expanded into a large aneurism, in consequence of which, the upper portion of the sternum, the sternal extremities of the clavicle, and the contiguous ribs were partly destroyed by caries. Where this had happened there did not remain the least vestige of the coats of the artery, to which, in other places, thick laminated concretions adhered.

Valsalva, xxvi. 9.

The deplorable exit of this man suggests, in the first place, how much care is necessary to counteract the increase of an incipient internal aneurism. If, however, from the ignorance of persons intrusted with the case, from the disobedience of the patient, or from the uncontrollable nature of the disease, the dilatation should increase so as ultimately to be covered only by the common integuments, then the utmost attention should be exercised, lest the bandages, especially when dried to the part, should be hastily removed, and every means by which life may be prolonged, should be adopted. The greatest tranquillity of mind and of body, and the utmost possible abstinence, ought to be observed; and the diet that is employed should be as unstimulating as possible. That posture of the body also must be preserved, which will tend most effectually to lessen the pressure of blood upon the attenuated skin; and something must be contrived by way of a defence, as the bladder of an ox four times doubled, or a bandage of soft leather glued to the sound skin in the circumference of the

tumour by some adhesive application. It must be recollected, however, that when the skin is extenuated, any considerable pressure is dangerous, and therefore, plates of steel, which have been advised, cannot be proper under such circumstances.—*Morgagni*, 10.

Case 11.

Aneurism of the aorta; the vertebræ excavated.

A man fifty years of age, who breathed short, and at times expectorated a little blood, having seized a hammer with both hands, and unremittingly struck something with great force for a considerable time, he suddenly fell down. He uttered a word or two to implore assistance, but soon was rendered speechless: he respired with difficulty, his face became pale, and within half an hour he died.

Dissection. The left cavity of the thorax was full of blood, the greater part of which had coagulated. The aorta was dilated into an aneurism at the part where it is inflected to the spine. The vertebræ were excavated, and the corresponding portion of the parietes of the aneurism was destroyed; and from that circumstance the blood had been effused.—*Valsalva*, xxvi. 3.

The preceding case shows how necessary it is to avoid those exertions by which the impetus of blood is liable to be increased, and the extenuated parietes of arteries broken through: the following instance, however, evinces that it may happen spontaneously.—*Morgagni*, 4.

Case 12.

Aneurism of the aorta; ribs destroyed.

A young man twenty-seven years of age, had long been afflicted with a pulsating tumour in the right side of the thorax, betwixt the third and fourth ribs; and when he turned from one side to the other, he was conscious of fluctuation in the tumour. He was often seized with a shortness of breathing, which, however, was speedily relieved by bleeding. One day whilst engaged at his devotional exercises, he suddenly fell, his face became pallid, his speech faltered, and he quickly expired.

Dissection. A large aneurism was found in the thorax. It commenced at the root of the carotid arteries, expanded to the sternum, and adhered so firmly to that bone as not to be removable without laceration. It extended beneath the right clavicle to the third and fourth ribs, and had hollowed out their internal surface, and made them rugged and unequal. It was also continued into the pericardium, and having ruptured there, that capsule was filled with blood.—*Valsalva*, xxvi. 5.

The succeeding case terminated fatally towards the end of November 1708, and was communicated to me the day afterwards by that most assiduous man, Sanctorini.

Case 13.

Aneurism of the descending aorta; vertebræ injured.

A robust young man who had been accustomed to reside on board the gallies, and who had previously been affected with some internal organic disease, became subject to a difficulty of breathing

after any considerable exertion, and was excessively sleepy after meals. He was frequently observed to apply both his hands to the lumbar region, and to rub that part strongly downwards as if he felt an uneasiness which was relieved by friction. He died suddenly whilst sitting by the fire-side in a house of ill-fame.

Dissection. Neither the legs nor the abdomen were tumid, but when the abdominal cavity was opened the diaphragm was observed to be depressed.

The right cavity of the thorax contained a large quantity of extravasated blood, which had escaped from the aorta a little above the diaphragm, at which part the artery was dilated into an aneurism as large as a fist. It was filled with membraniform concretions; and had ruptured on the right side. On the contrary side the bodies of the contiguous vertebræ were so injured that a large osseous scale was drawn off without the least difficulty. The heart was extremely firm and contracted.—*Morgagni*, xxvi. 11.

The somnolency after taking food may be ascribable to the aneurism, and a distended state of the stomach, by the conjoined effects of which the blood-vessels were compressed, and a larger quantity of blood was consequently determined to the brain. When we consider the place in which the fatal catastrophe happened, it is probable that the aneurism did not rupture when he was sitting by the fire, but under different circumstances. The Deity does not always permit sin to be concealed, but sometimes he punishes the delinquent in the

commission of the crime, by the crime itself. Sudden death from the rupture of vessels has occurred in other instances, *in æstu venereo;* and the ensuing history affords a horrid example of mortality under these circumstances.—12.

Case 14.

Aneurism of the aorta; disease in the organs of generation.

A meager prostitute, twenty-eight years of age, had complained for some months of lassitude of body and loathing of food; and during the last fifteen days of life these symptoms had become more urgent in degree. As she took less aliment, she substituted for that deficiency an increased excess in wine, to which she had previously been addicted. A debauchee having entered her house, came out soon afterwards betraying a confused and agitated deportment; and as the woman had not appeared for two or three hours, the neighbours went in and found her dead and cold—*jacentem in lecto ea corporis figura, ut dubitari non posset, quo in opere interiisset, præsertim cum virile semen conspiceretur quod e locis muliebribus defluebat.* This circumstance occurred in June 1725, and the weather was extremely hot, but we were not permitted to dissect the body till the following day, when I sent my friend Mediavia to examine the whole, requesting him to bring the organs principally concerned for my inspection.

Dissection. The abdomen was tense; the small intestines were of a red colour, and the large

intestines, especially those of them nearest to the anus, were distended with fæces. The stomach was exceedingly capacious though nearly empty; and about a pint of serous fluid, which resembled turbid bloody water, had been effused into the abdomen. This fluid was of so acrid a quality that it induced a burning sensation in the extremities of the fingers.

The pericardium was greatly distended with a fluid similar to that reported to have occupied the abdomen; and beneath it, some black and firmly coagulated blood covered the surface of the heart. These parts and the genital organs were brought to me, but neither the heart nor the trunk of the aorta appeared to be dilated. However, on cutting into this vessel I found that, at the left extremity of the arch morbid appearances could be distinctly perceived, and onward to the heart they were still more strongly marked. In some places there were opaque spots which denoted subsequent ossification; in others we observed the commencement of small foramina, and likewise parallel longitudinal furrows. The semilunar valves were contracted, and, at the space of half a digit from them, there existed an orifice in the parietes of the artery sufficient to receive the extremity of a thumb; and this foramen communicated with a roundish aneurism which was appended to the artery in the form of a sacculus. It was the size of a large walnut, and was so situated at the posterior part of the aorta, as to have obstructed the functions of the left auricle or of the contiguous sinus. It had been ruptured in its upper part, and blood had

issued from it into the pericardium by a moderate-sized foramen. The inferior surface of the sac was lined with lamellar concretions.

The extremity of one of the Fallopian tubes adhered to the corresponding ovarium, and the extremity of each of these tubes was closed, so that neither an orifice nor fimbriæ were observable. Both of them, however, appeared wider at that part than usual, and when cut into, they exhibited rather an excessive quantity of that secretion which is peculiar to them, and which by some has been considered as the *semen virile;* but it was of a very thick consistence, and the last that issued was somewhat bloody. The ovarium to which it has been said one of the tubes adhered, was occupied by a considerable number of large vesicles; and the other was enlarged, not only by vesicles, but also in consequence of a considerable quantity of blood being extravasated beneath its membrane. The inner surface of the uterus was universally of a brownish red colour; the os uteri was narrow, and contained a thick and whitish matter; and as this was unlike the mucus generally found there, it was supposed that the woman laboured under leucorrhœa.

Morgagni, xxvi. 13.

When other causes exist, it is not only obvious to reason, but has been demonstrated by dissection, that venereal indulgences greatly tend to accelerate death, by exciting the circulation of blood. They occasion the rupture of latent aneurisms, and the laceration of vessels in the head, which without this or a similar excitation,

might have continued to perform their functions much longer—perhaps till old age.—14.

Case 15.

Dilatation and disorganization of the aorta, and excrescences on the valves of the heart; combined with apoplexy.

The subject of the following case was a corpulent woman fifty years of age, of sober habits and naturally dejected and reserved. She did not labour under any manifest disease till the last two or three years of her life, during which she underwent a gradual cessation of the menstrual discharge, and was annoyed with what she designated a sense of wind about the heart and its vicinity. She was a weaver by trade, and having risen early and made preparation to work, she expired suddenly. Though she lived in the country, the physician and surgeon on whom that duty devolved, were sent thither to examine the body.

Dissection. The neck and arms of the corpse were rigid. As soon as the cranium was opened, a large quantity of blood escaped, and it appeared that some vessel betwixt the cerebrum and cerebellum was lacerated.

The pericardium was extremely distended, and, on being punctured, a bloody serum issued, and the remaining part of the blood, which was coagulated, adhered to the heart. The heart itself was in a natural state, except that the borders of the tricuspid and mitral valves were occupied by small roundish tubercles resembling glands, an appearance not unfrequent. There were some opaque

spots, and a small protuberance on the inner surface of the artery, where it was affixed to the vertebræ; the prominence, however, though unnatural, was constituted of the natural substance of the artery. From the origin of the left carotid artery to the heart, the vessel was wider than usual, and internally was rugged and unequal from bony lamellæ, which were so numerously distributed as scarcely to leave any intervals between them. In these small interstices the internal coat of the vessel was attenuated by ulceration; and at one place the blood had gradually insinuated itself through one of the intervals, detaching and elevating the external coat from the inner, so that there was an appearance of extended ecchymosis; and coagulated blood existed at that part. By the continued distension the blood had ultimately burst the exterior tunic, and was extravasated into the pericardium.—*Morgagni*, xxvi, 17.

The circumstance that death so speedily occurs from the extravasation of no larger a quantity of blood than can be contained in the pericardium, may surprise some persons. For if we suppose it to be distended, and then to contain two pints, as has been estimated; yet a much larger quantity is often lost in hæmorrhages within twelve or fifteen hours. Here, however, the blood is effused at once, and flows from the very trunk of the aorta near its origin—circumstances which materially differ from its flowing gradually out of distant branches: and its escape into the pericardium must be distinguished from its discharge externally. Although the heart continues to act

whilst it is surrounded with the water of dropsy, there is the utmost dissimilarity between the effects produced by a fluid gradually deposited, and the sudden effusion of blood. It must be remarked, too, that extravasated blood, by its immediate coagulation, approximates to the nature of a solid body, which, on being applied to the heart, suspends its action and induces syncope. Senac demonstrated this fact in the cases of two wounded men, in whom that effect was produced by touching the heart with a probe or a finger. The diseased state of the aorta would conduce to the fatal termination in these cases.—18.

Case 16.

Aneurism of the aorta, with turgescence of vessels in the head.

About the middle of May 1738, a woman of this place, upwards of thirty years of age, was suddenly and unexpectedly cut off by death.

Dissection. The abdomen contained a moderate redundance of serous fluid.

The pericardium was filled with blood from an aneurism of the aorta, which involved the whole arch of that vessel, and had ruptured into the membraneous capsule of the heart.

The vessels of the pia mater were moderately turgid with blood, and small red drops presented themselves every where in the sections of medullary substance.—*Morgagni*, xxvi. 19.

The influence which passions of the mind exert on pulmonary circulation has been shown in connexion with one of the preceding cases, and this

influence is often exerted upon the heart and aorta. Patients having aneurism or other diseases of the aorta, have died suddenly in a paroxysm of anger, and the pericardium was filled with blood; or blood has, at least, been extravasated.—xxvi. 26.

An old man, attempting to escape apprehension after having been guilty of stealing, was struck with a club and fell lifeless. The aorta was found to be lacerated transversely; and it is probable that the various passions awakened in the attempted flight had contributed to the rupture of the vessel.

Morgagni, liii. 35.

Tabarrano mentions the case of Cardinal Boncompagno at Rome, whose sudden death arose from ulceration and ultimate rupture of the pulmonary artery, in consequence of which blood had escaped into the pericardium. He had complained of most of the symptoms which usually attend cases of thoracic aneurism.

In a soldier who died suddenly after protracted grief, a large quantity of coagulated blood was found in the pericardium.

Ramazzini relates the case of a man who died suddenly, in whose pericardium two pounds of coagulated blood were found.

Two cases are upon record in which sudden death happened from rupture of one of the coronary arteries, and the consequent extravasation of blood into the same bag.

If blood is found in the pericardium when decease had not been sudden, it must have been extravasated gradually either from small vessels or through minute orifices.—*Morgagni*, xxvi. 26.

Case 17.

Aneurism of the abdominal aorta from injury; bones absorbed.

A carman at Padua, somewhat above thirty years of age, fell down, and a wheel crossed his abdomen. With the exception of having contracted a syphilitic affection, he had previously been a healthy and robust man, but, after the accident, he was seized with such severe pain in the loins and back that he was compelled to confine himself to bed for eight months. After he had been seen by several physicians, Vallisneri was consulted, and observing that the patient complained chiefly of violent pain in the left lumbar region, he applied his hand to that part, and detected a pulsation which seemed to arise from an aneurism. He suggested such measures as tended to prolong the man's life, without any idea of curing the disease. The part afterwards swelled, and the tumefaction extended wide, and even raised the contiguous ribs; and the corresponding leg and thigh became œdematous. An unskilful surgeon attempted to promote suppuration, and afterwards, when vesication and fissures appeared on the surface, he opened the tumour. A copious effusion of blood immediately ensued, and the man died within a quarter of an hour. This event happened on the fourth of November 1719, and at the request of Vallisneri I was present at the examination.

Dissection. As soon as the abdomen was opened an aneurism presented itself as large as any I had ever witnessed. It extended from the diaphragm to the pelvis, and occupied all the space

from the right side of the vertebræ to the left side of the distended abdomen. The spleen, the stomach, the intestines, the mesentery, the vena cava, and the left kidney, were so far displaced towards the right side, that even the left kidney was situated in the umbilical region. The aneurism was of an oval figure, but when full of blood it had been spherical. It contained a large quantity of lamellated concretions in the circumference, and of grumous blood in its centre. When this blood had been removed, we observed that the aorta began to dilate in a direction towards the right side, as soon as it entered the abdomen; not more so, however, than to admit a clenched fist. It then expanded to the left side, which appeared to constitute the anterior and lateral parietes of the aneurism; and the sac communicated largely with the aorta betwixt the appendices of the diaphragm. When the lateral parietes reached the posterior parts, they terminated; and their border was closely adherent to those parts which the aneurism had not displaced, so that they constituted part of the parietes of the aneurism. Those of them, however, which, in consequence of their bony nature, yielded less to the impulse of the blood, were carious; and the periostium was ulcerated. The lower rib, the concave surface of the ilium, and the vertebræ, were most diseased: for the transverse processes, and the bodies of the latter, were nearly destroyed, whilst the thick intervertebral cartilages were all in their natural situation, prominent, untouched by disease, and beautifully white. We were surprised to find all

the abdominal viscera free from organic lesion, amid such inversion of their natural order.

The pericardium contained more fluid than usual.—*Morgagni*, xl. 26.

There are on record many cases of abdominal tumours, by which the spine had been rendered carious; the nature of them does not appear to have been understood by the narrators; but it appears to me that they were aneurisms. These cases were accompanied with violent pains in the loins. I was consulted by a brazier who had long been afflicted with violent pain in the loins and back. I suspected aneurism of the aorta, and after death this artery was found dilated.—27.

Certainly there are cases in which the symptoms are perfectly obscure. The following instance affords an example.

Case 18.

Aneurism of the abdominal aorta, which ruptured into the thorax.

An old man, who was believed to have had lues venerea at a former period, had been in this hospital many days, complaining of every thing but what could relate to syphilis, or to aneurism of the aorta. I investigated the case with the utmost attention, but certainly he neither complained of pain, nor a sense of weight, nor any dyspnœa. One day in December 1718, soon after he had taken his dinner, he died suddenly.

Dissection. The appearance of the urethra confirmed the opinion of an old syphilitic affection, for it was full of cicatrices, and the seminal

caruncle did not possess its natural figure. It was not easy to demonstrate the two very small orifices which open on the sides of this prominence, or to discover the intervening sinus. To these circumstances were added distinct and prominent fibres, which formed a kind of small triangle, the basis of which was near the bladder, while the apex touched the caruncle.

When the abdominal viscera were removed, a large aneurism of the aorta presented itself, which, in figure, resembled a crescent, the dorsum of which was placed transversely under the annexed diaphragm, while the cornua were directed downwards, and concealed behind the psoas muscles on each side. This aneurism, likewise, had no posterior parietes. The blood had formed lamellated concretions, and when these were removed, the bodies of two or three vertebræ that belonged to the lower part of the thorax and upper part of the loins immediately appeared. They were denuded and deeply destroyed, but the white intervertebral cartilages were prominent, and apparently untouched by disease. The aneurism had ruptured at its upper part, where the diaphragm had also given way, and the left cavity of the thorax was filled with blood.

Morgagni, xl. 29.

Although this large aneurism was so extremely obscure when I saw it, it can scarcely be doubted that some indications of it, especially pain in the loins, must have preceded.

In some cases of aortic aneurism, the intervertebral cartilages have been found ulcerated or

absorbed as much as the vertebræ, and in others, as in the preceding instances, they remain uninjured. The reason of this difference is not very obvious.—30.

The lamellated concretions which often form in aneurisms, especially those connected with the artery like a sac, and adhere to all its sides, are very different from concretions in the heart, or blood coagulated out of the body. They do not form, however, in all aneurisms, even where circumstances, by retarding the motion of the blood, appear favourable to their formation. In an aneurismal sac, the blood is almost stationary, and at the latter period of the disease, the body is generally preserved quiescent, to guard against syncope and suffocation; and if no concretions formed previous to death, I should suppose there existed some latent cause which would prevent the coagulation of the blood afterwards.

Morgagni, xvii. 29.

Valsalva found aneurism of the aorta a much more common occurrence than he expected, and therefore was solicitous to adopt measures to counteract it in the beginning. With a view to cure internal varices of veins Hippocrates said "*conducit* "*autem talibus, si ab initio curandos suscipies, ut et* "*venæ de manibus sanguinem emittant, et diæta e qua* "*quam siccissimus et exanguissimus fiat,*" and in relation to the advantage of this practice he subjoins "*si curentur incipiente morbo, rursus in loco venæ* "*considunt ad latus, humilesque fiunt.*" Albertini, the companion of Valsalva's studies, adopted this practice in cases of internal varices of veins with

almost unexampled perseverance, and with great advantage; and the same result was found to be attainable in relation to the arteries, by the same means. In determining its utility Valsalva did not rely merely upon the cessation of pulsation, and the subsidence of the other symptoms which attend the early stage of aneurism. He also had an opportunity of observing in the body of a nobleman who had been cured of aneurism under this treatment, and who died of another disease, that the vessel in which aneurism had commenced, had contracted again to its natural diameter, though its coats, in that part, were somewhat callous.

When Valsalva had withdrawn as much blood as was requisite, he ordered a progressive diminution of food and drink till the quantity was reduced to a determined weight of aliment and water. Having so enfeebled the patient that he could scarcely raise his hand from bed, on which he was ordered to lie from the beginning, the quantity of aliment was cautiously increased, till that degree of strength was regained which warranted the patient to rise from bed. Stancario succeeded in curing a young nun in the same manner. On the first days, after she rose from bed, the pulsation returned, but it did not continue, and, at length, entirely ceased. It will not, in general, recur, unless the patient refuses to confine himself to a temperate system of diet.— 30.

There are many persons, however, to whom Valsalva's method of cure may appear more intolerable than the aneurism itself, especially at the only time when any treatment could avail. The

inconvenience of the disease at that period is but slight, and the danger is not imminent; and from its being wholly unobserved by the patient, he flatters himself with hopes of recovery. But his feelings must be widely different when the disease has attained that stage in which neither the suffering, which is constant and exceedingly grievous, nor death itself, which is hourly impending, can be averted by any remedy. Patients who will not endure parsimony of diet when it might remove the disease, are sometimes necessitated to undergo the most extreme hunger from inability to swallow, when their strength is so exhausted, that abstinence accelerates the fatal termination; and when bleedings, which if early employed are beneficial, would likewise be injurious.

The following case, though certainly an imperfect one, shows how much may be effected under this practice. An old woman came into the hospital at Bologna in consequence of inflammation of the eyes, when she was observed to have an aneurism, near the larynx, about the size of a walnut. It commenced nine years before, after great bodily fatigue. Bleeding every two months had been prescribed, and notwithstanding many irregularities in diet, this depletive measure had contributed to preserve the disease stationary for so many years.*—31.

* The formation of concretions in concentric laminæ is a circumstance generally observed in cases of aneurism, though but seldom, if ever, in cases of preternatural dilatation of the whole circumference of the artery. It does not arise from the mere coagulation of blood, but from the deposition of its fibrous parts in successive layers; and sometimes it advances to such a

SECTION XVI.

Rupture of other vessels in the thorax.

Sudden death may be produced from the rupture of the pulmonary vein and vena cava, and of

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degree as to completely fill the cyst, and the communication between it and the artery becomes obliterated. Whenever this fortunate event has occurred, another process commences, namely, the absorption of the lamellated coagulum, and the progressive contraction of the sac; and by this means a permanent cure is effected, without inevitably diminishing the caliber of the artery. This, however, is not always the case, for the aorta has been found obliterated under circumstances which led to a belief that it originated in the spontaneous cure of aneurism. In a case which recently fell under my notice, the congealed fibrous substance possessed incompressible solidity; it was of a globular figure, and about as large as a fist. The blood continued to traverse it only in one very narrow channel, the smallest deposition in which would have rendered the sac completely impervious.

When an aneurism is situated in a part beyond the access of a ligature, the principal aim in the plan of treatment, should be to subdue the force of circulation, and to promote the formation of coagula in the sac. To Albertini and Valsalva the merit is due of having first adopted the most efficient measures to answer these indications, not only in arterial aneurisms but also in aneurisms of the heart, though in the latter it can only be appropriate to the active form. Albertini first announced his method of curing aneurisms in "The Memoirs of the Academy "of Bologna," and the result of this debilitating treatment was found by Valsalva and other physicians at Bologna, commensurate with the expectation excited. Morgagni has given an adequate exposition of this plan of treatment, and I shall only add that conjointly with depletive measures, and perfect quietude of body, it is of great importance to maintain an equal degree of mental tranquillity, and to direct due attention to the condition of

other veins and arteries. If, from the obstructions which arise in disease, or from the influence of mental passions acting upon the right cavities of the heart, the pulmonary artery, the lungs and pulmonary vein, as well as upon the left cavities of heart and aorta, the motion of the blood through the vena cava should be impeded, the dilatation and rupture of that vessel are likely to happen; and though there is not equal probability of this accident occurring to the pulmonary vein, yet instances of that occurrence are not wanting. Several cases of rupture of the vena cava are recorded, but they were mostly complicated with disease in the heart or aorta. It is highly desirable that those who meet with rupture of the vena cava, especially when uncomplicated, should accurately and perspicuously record the symptoms which preceded death, as well as the appearances on dissection.—*Morgagni*, xxvi. 28.

Although the following cases do not strictly relate to aneurism, their introduction here will not be unseasonable. The first was communicated to me by that learned physician Manfredi, in the year 1718.

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the alimentary canal. Depletives will often be found a palliative remedy, when there is no rational ground to expect that it can avail as a curative measure. There is a limit, however, beyond which the abstraction of blood, and other debilitating agents, so far from impeding the current, occasion an irritative and unequal distribution of blood, which is by no means favourable to the removal of this morbid state of the vascular system, or to the alleviation of the distressing symptoms which arise from it.—*Ed.*

Case 1.

Vena azygos varicose and ruptured.

A woman who had laboured under phthisis for a considerable time was found to have expired suddenly. The inferior part of the left lung contained three or four suppurated tubercles; the opposite lung was in a healthy state, yet the right cavity was occupied by four pounds of coagulated blood. It had been extravasated from the vena sine pari, which though collapsed in consequence of the effusion, had been so dilated, through the extent of a span, as to equal the size of the vena cava. The coats were perforated about the middle of that space.—*Morgagni*, xxvi. 29.

The bronchial, and other arteries ruptured.

Leprotti has related a case of unexpected death in which it was discovered that blood from a rupture in the bronchial artery was effused into the posterior mediastinum, and had insinuated itself to a considerable extent, through the interstices of the fibres by which the trachea, the aorta, the œsophagus, and adjacent parts, are united together; and being coagulated, it had raised up the membranes into the form of tumour.

In Trombelli, an excellent surgeon and physician at Bologna, blood was extravasated from some artery between the laminæ of the anterior mediastinum, and by its being diffused through the cellular substance of this part, and having coagulated, the mediastinum, contiguous to the diaphragm, was nearly three inches in solid thickness. The former

lived three days, the latter, in whose aorta there was a large tubercle,* was taken off in nineteen hours.—*Morgagni*, xxvi. 39.

Case 2.

Rupture of blood vessels in the parietes of the thorax, without external wound.

A man was kicked on the thorax by a horse. No external mark of injury was manifest, but the man experienced extreme difficulty of breathing, which neither bleeding nor any other measures were adequate to subdue. He died on the fifteenth day.

Dissection. No rib was fractured, but a large quantity of blood was extravasated between the ribs and the costal pleura, by which a considerable tumour was occasioned, and the lung corresponding with this tumefaction of the parietes had sustained some lesion.—*Morgagni*, liii. 32.

Death has often resulted from injuries of the thorax independent of any external wound.

External aneurisms.

Some cases of popliteal aneurism were cured by Valsalva on the plan by which he treated internal aneurisms, namely, bleeding and slender diet.

Morgagni, l. 10.

Case 1.

Inguinal aneurism; the posterior crural nerve ulcerated.

A man forty years of age had a small pulsating tumour which arose gradually about the right groin.

* See page 436.

During the space of three years it daily increased, and acquired a large size. About the third month before his death it became painful, and occasioned considerable œdema of the leg, the tumefaction of which was equal. Within the last month the pain was extremely violent, not only in the tumour, but sometimes also below the malleolus internus, in which place sensibility remained, but the rest of the foot was destitute of sensation and motion. Indeed no feeling was retained in the ankle except during the continuance of pain. Through the whole of the last month the patient had no respite from excruciating torture.

Dissection. An immense cavity was found after death, extending from the anterior part of the thigh to the posterior crural nerve. The femoral artery, after being moderately dilated, had ruptured; and the effused blood had formed the large cavity by detaching the muscles. The muscles were partially ulcerated, and the nerve itself was so eroded that only a few of its fibres remained by which the upper part was united to the lower.—*Valsalva*, l. 11.

The condition of the nerve elucidated the previous state of the limb as to its sensibility. The sense of feeling and the power of motion were abolished, because nearly all the nerves which are distributed to this part proceed from the posterior crural; but to the inner ankle a branch is distributed, which arises from the anterior crural nerve, and generally accompanies the vena saphæna. Whenever aneurisms, even those which are external, are seated very near the nerves, or other parts of acute sensibility, life may be destroyed by

the very severe and excruciating pain which is excited.—*Morgagni*, 12.

On the examination of a case of popliteal aneurism which had sphacelated, and the hæmorrhage from which had proved fatal, not only were the nerves and veins running between the condyles of the femur nearly destroyed, but the bones themselves were partly carious.

Injury of the artery from bleeding.

A surgeon about eighteen years of age, losing blood from his arm on account of pulmonary disease, had the artery wounded. The person who bled him, supposing that he had opened a vein, tied up the wound in the usual manner. After some days, however, a tumour was observed at the elbow, which, within about twenty days, increased to the size of an apple. A surgeon who supposed that it contained pus opened it, and blood issued from the wound, but, in consequence of coagula plugging the orifice in the artery, the blood did not flow with an impetus. Three days afterwards the blood burst forth, and the hæmorrhage recurred once on each of the two following days, so that the patient was reduced to a state of syncope. The hand, the fore-arm, and the humerus swelled, and inflammation arose near the incision in the tumour. With other physicians Valsalva was called in. He applied a tourniquet to the upper part of the arm, laid open the tumour, washed away the coagula, and tied the artery immediately above the puncture. In all that part of the limb below the ligature there was an

immediate abolition of sensibility and motion; and a few hours afterwards it became quite cold. No pulsation was perceptible till about the third day, but on the fifth day it had regained its usual strength. Towards the close of this day blood was discovered in the bed, and the bandages were found wet; but on their being cautiously removed, no blood was then flowing, nor was there any indication whence it had flowed. In consequence of this hæmorrhage the pulsation was again lost, but the limb regained its natural temperature and motion a few days afterwards. A degree of weakness, however, remained for eight or nine months; the limb wasted, the nails had a brown colour, and there was great susceptibility of injury from cold. At the termination of this period all the symptoms disappeared, and the pulse returned, although in a languid state.—*Morgagni*, l. 7.

The man lived about thirty years afterwards, and then died of consumption and ascites, and the body was dissected by Peter Paul Molinelli. On examination after death the brachial artery was deficient for about two inches, where the aneurism had been situated. Only one artery could be discovered which kept up the communication between the trunk of the brachial artery and the radial and ulnar arteries. The communicating vessel was surprisingly tortuous, and so slender that it was difficult to conceive how the radial artery in this arm should have pulsated equally with that in the other arm, and by what means both arms had been equally nourished. The nerve, which seems to have been included in the

ligature with the artery, was enlarged into a ganglion at the bend of the elbow.

Haller and other anatomists have found the collateral branches enlarged, though not equally, when the course of an artery has been intercepted. It seems probable that sometimes only one branch may be dilated, and at others more.—8.

There is not much reason to hope for recovery, after the division of the large vessels of the neck. If the carotid artery is divided, it is not sufficient to tie the lower orifice; a ligature must be applied upon the upper also. Schlichtingius has related an instance of the cure of a wound inflicted on the internal jugular vein.*—liii. 22.

Asphyxia†, *and other peculiarities of the pulse.*

Cases of asphyxia from adhesion between the pericardium and heart—from a diseased state of the cerebellum—and from lesion in the valves of the heart, and in the vessels, have been related; and

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* The precaution of applying two ligatures should not be confined to the carotid artery. Some years ago I witnessed an instance in which a man bled to death from a wound of the brachial artery, in consequence of the surgeon neglecting to tie the lower orifice. In the recurrence of hæmorrhage the case precisely resembled that just related by Morgagni, and whenever the surgeon was called he found no hæmorrhage. At length, however, the patient sunk under the repeated loss of blood.—*Ed.*

† The term asphyxia has been applied to two morbid states of the body. In one case, it denotes a total suspension of all the mental and corporal functions; and in the other, a failure or cessation of the pulse, with little or no disturbance of perception or of voluntary power.—*Good's Nosology.* The appellation is employed by Morgagni in the latter sense.—*Ed.*

therefore only those cases will be subjoined which were not clearly entitled to a place among other diseases.

Case 1.

Asphyxia from effusion into the brain, and diseased vessels; with hardness of the cerebrum.

An old man had been brought into this hospital on account of a fractured leg; and in consequence of slight but obstinate fever he had remained three months, when it was unexpectedly discovered that he had no pulse. Previous to this period the arterial action had not even betrayed intermission, and the man affirmed that he was unconscious of any increase of disease; and, to confirm that statement, he immediately raised himself in the bed, and sat upright: nevertheless, he died soon afterwards.

Dissection. When the head was detached from the body no serous fluid escaped from the spinal canal; but it flowed copiously from the cranium at the time of sawing round it, and a considerable redundance was found in the lateral ventricles. The substance of the cerebrum was extremely hard —probably its firmness exceeded that of any other which had occurred to me; and the blood vessels, but especially the sinuses, were turgid with blood of a black colour. Two of the arteries, which ran between the hemispheres of the cerebrum near the upper surface of the corpus callosum, contained bubbles of air, although the season was very cold, and only three days had elapsed since the man's death; nor was there any evidence of putrefaction. A considerable portion of the coats of the right

carotid artery, where that artery emerged from the canalis caroticus, was thickened, and of a nature that may be ranked between ligament and cartilage. A similar alteration of structure had commenced in some larger arteries of the cerebrum. Exterior to the cranium this disease was more considerable; for on one side of the neck, at the bifurcation of the carotid artery, a rather large bony scale was found between the coats of the vessel; and the trunk of the same artery was dilated universally, to a considerable degree. The aorta, near the valves, and in some other places, exhibited the rudiments of ossification.—*Morgagni*, xxiv. 6.

I apprehend that the asphyxia may be ascribed to the sudden deposition of serous fluid; in the same way that it was produced in a boy, whose cerebellum was partially destroyed by suppuration, and who was without pulsation during many days before his decease.*

In the case of a young man, in whom the asphyxia was attributed, as it often is, to polypi in the heart, that organ was found greatly enlarged, and its fibres extremely flaccid.†

In a woman, whose heart was enlarged, and who had a frequent recurrence of asphyxia, I thought that circumstance was inexplicable without supposing the existence of spasm. For as often as she was seized with convulsive asthma, or with paroxysms which resembled that disease, and was brought into the hospital, her pulse was imperceptible.‡ This failure of the pulse often occurs to hysterical women.

* Vide page 173. † Page 382. ‡ Page 400.

Riolanus reports that he has known persons live many years with this state of pulse, but it was accompanied with extreme debility.

Sometimes the pulse is not perceived in consequence of an unnatural smallness, or of an unusual distribution of those arteries which physicians are accustomed to feel, or of some obstruction in them. They are small in those persons in whom they are divided into numerous branches higher up than usual, or in whom the ulnar artery is larger than the radial. Their distribution is unnatural when they are situated unusually deep, or when they run upon the back of the radius.—7.

Other examples of that kind of natural asphyxia, either in one or both wrists, may be found in the Sepulchretum. In such cases as these, we must guard against being deceived, and if the state of the artery in one arm should awaken alarm, the examination of the other ought not to be omitted: and should there exist deficiency of pulsation in both the wrists, the attention should be directed to other arteries, as the temporal, carotid, or the femoral in the groin. An asphyxia of either description may happen from an accidental obstruction of one or of both the radial arteries, by means of a coagulum, or from some other cause. In a case of peripneumony, the pulse of the right wrist was nearly imperceptible, and it appeared to have occurred in consequence of an induration of the lung on that side, by which the right subclavian artery had been compressed.*—8.

* Corvisart, after noticing the great diversities in the state of the pulse during diseases of the heart, observes, "One of the

Some cases of asphyxia are accompanied with great diminution of strength and vital power, and

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" most singular characters which the pulse offers in some " diseases of the heart is, its difference in the two arms, or its " being perceptible in one and not in the other.

" I know," says he, " that it may sometimes arise from an " obliteration or ossification of an artery, of which I have given " an instance; but it will generally be found to depend upon an " organic lesion of the heart or great vessels, as the following " observations prove.

" 1.—An aneurismal tumour of the heart or large vessels, may " be so situated as to press upon one of the subclavian arteries, " and prevent the usual quantity of blood from flowing into it, " or almost totally to obliterate its area.

" 2.—I have seen in more than one aneurism of the aorta, the " mouth of these arteries contracted by the swelling of the " internal surface of the coats of that vessel and of the circum- " ference of the arterial orifice, which may itself, perhaps, be in " a state of ossification. The arteries which originate from the " arch of the aorta very rarely participate in the disposition to " be dilated when this spot is the seat of an aneurismal tumour; " but they are often so much compressed by it as to weaken and " even destroy the pulse in one arm, and that generally the left.

" 3.—I have seen a person affected with aneurism of the aorta, " in whom the want of pulse in the right arm was owing to a " kind of hard and cartilaginous valvular spur, situated forwards " in the aorta, and which, by its direction, turned the whole of " the column of blood into the carotid, and prevented its entrance " into the subclavian artery of that side."

Corvisart on the Heart, transl. by Dr. Hebb, p. 336.

To these causes might be added obstruction of the subclavian artery by coagulable lymph, and by adhesive inflammation. Spasmodic affections, too, I believe, may effect this contrariety in the pulsations of opposite arteries. The following I consider an instance of diversity of pulsation, from nervous irritability, derived from gastric disorder.

Early in the morning of the twenty-fourth of last October I was requested to see a gentleman, about fifty years of age, who

dulness of the senses; but in other cases the powers of mind and body are in vigorous exercise.

Ramazzini related the case of a young man in

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was labouring under extreme distress from pain in the region of the heart. The history given me was, that, for some months, the patient had been annoyed with flatulence and acidity in the stomach, and occasional dejection of mind; and within the last fortnight, especially after a little exertion, he had experienced oppression at the chest, and pain in the heart; but these attacks generally soon passed off. The paroxysm, however, had continued throughout the night preceding my visit. The pain was diffused through nearly the whole of the left region of the chest, it extended to the shoulder, and down the arm to the ends of the fingers. He could make a deep inspiration without any material increase of suffering. His countenance did not evince a degree of disease equivalent to the distress he appeared to suffer. He said the agony was inconceivably violent, and peculiar in its nature: but though it had been constant during the night, the degree was occasionally heightened; and whilst these accessions lasted he felt as if instant death were inevitable. The left arm had been almost cold, but when I saw him it was nearly as warm as the right. The pulse, in this wrist, was scarcely perceptible, and occasionally it was intermittent; but the action of the opposite radial artery was strong, rather full, regular, and about a hundred and thirty in a minute. He had no pain in the head, nor any tendency to syncope. I regarded it, at this time, as a case of angina pectoris.

About eight ounces of blood were withdrawn, and he took some hydr. submurias, with sulphate and carbonate of magnesia; and adopted an abstemious plan of diet. In the course of the day he had one or two severe attacks, but in the evening his circumstances were decidedly improved. On the twenty-fifth the pulsations were more equal; he experienced but little pain, though he distinguished a sense of weight in the region of the stomach, and some fulness in the fauces. On the twenty-sixth the pulsations were equal, about a hundred in the minute, and moderately soft. He now took an alkaline bitter, and an occasional dose of mercury, and recovered in a few days.—*Ed.*

whom, for the space of four days, no pulsation could be perceived in any of the arteries, yet he was strong and active; and even on the day of his decease he rose from bed and dressed himself. During these four days he was perfectly cold, and did not micturate. Both coldness and ischuria have frequently occurred in these patients. I do not recollect, however, that either of these circumstances has been observed, in general, till about the termination of the asphyxia.

It is remarkable that whilst there is so great a diminution in the action of the arteries, other functions do not cease, as in paroxysms of syncope. It occasionally happens that wonted health is regained after the lapse of many days, during which the body was cold and pulsation suspended. Bartholin observed this cessation of the pulse for six days, yet the patient recovered.*

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* In a work of this nature it would be highly improper to overlook the case of John Hunter, who laboured under symptoms of angina pectoris for twenty years. When attacked, and feeling pain in the region of the pylorus, he accidentally observed that his face was pallid, and like that of a dead man: and on applying his finger to the wrists, he discovered that there was no pulsation in either radial artery, and there was also a cessation of involuntary respiration. He continued in this state for three quarters of an hour, and felt as if death would certainly happen if breathing was not carried on by voluntary efforts. Exertion always brought on a paroxysm, though not all kinds of exertion in an equal degree; and he was liable to attacks from distension of the stomach. The disease had originated from an affection of the mind, and from no causes were the subsequent paroxysms so severe as from mental perturbation. On the sixteenth of October 1793, when performing his duties at St. George's Hospital, an

Some light may yet be thrown upon this obscure subject, if the body of a woman who is perhaps still living at Paris should be examined with that attention which the case deserves. In this female asphyxia has existed from birth, and no pulsation has been perceived in any artery, or indeed in the heart, even after the most violent exertions, or in the highest temperature of fever—a disease to which she is peculiarly liable. The case is related in the Hist. de l'Acad. R. des Sc. A. 1748.—9.

Scarcely any disease more approximates to a state of asphyxia than a remarkably small pulse, united with debility. Sometimes there is naturally a slender pulse, and this I supposed to be the case with a robust woman, habituated to considerable exertion, who was violently attacked with angina; but although the pulse was extremely small, I was not deterred from withdrawing as much blood as the urgency of the disease required. After her recovery, however, I found that the pulse was the same as it had been during her illness, and I

accession was produced by agitated feelings, and suddenly terminated the life of this extraordinarily useful man.

Dissection. The coats of the stomach and of the intestines were loaded with blood. The pericardium was thickened, so that it did not collapse on being opened. The heart was very small, and seemed to be contracted, or rather shrunk in size. The muscular structure of this organ was paler in colour and of a looser texture than the other muscles. The coronary arteries were converted into bony tubes. The mitral valves were ossified in places, and the aortic valves did not retain their usual pliancy. There was an incipient aneurism of the aorta.

The vessels of the pia mater were turgid with blood; the carotid artery, in the sella tursica, was ossified, and the vertebral artery was bony.—*Ed.*

ascribed it to congenital smallness of the superficial arteries. But this feebleness of pulsation is generally the result of disease, and varies according to the circumstances in which it originates.—10.

It has been shown to arise from disease in the aorta, and from adhesion of the pericardium to the heart, though the pulse is not unfrequently of an opposite character from this organic lesion. Senac has attempted to explain these contrarieties by referring to an increased resistance being at one time derived from excessive plenitude, whence it happens that not only does the fulness of the pulse increase after bleeding, but it becomes stronger. And he refers to the coats of the arteries being contracted, at another time, by nervous influence, a circumstance which happens in hysterical women. Some cases of asphyxia are of short duration, others protracted and fatal, not only in hysterical women, but in other persons, in whom there does not appear any thing to account for it, except nervous influence.—12.

The following case of hydrops pericardii was attended with peculiar weakness of the pulse.

Case 2.

Weakness of pulse from hydrops pericardii, and disease of the heart and liver.

A middle-aged man, who was a hemp-dresser, came into the hospital of St. Mary de Morte in the spring of 1705, complaining of pain in the right hypochondrium. In this part there was an evident tumour, which resisted the hand, and appeared to be seated in the liver. The pulse was the smallest,

the weakest, and the most frequent I had ever met with. About four hours after coming into the hospital, he was attacked with such violent pain in what he designated the stomach, that from its severity, and the paleness of his face—from the cold perspiration which attended it—from the pulse being almost imperceptible—and from the respiration being in the state it generally is in dying persons, he appeared actually on the point of death. From this attack, however, he recovered, and related to the persons around him, that he had several times undergone similar paroxysms. His pulse returned to the state I have described. On the following day the physician ordered blood to be withdrawn from the arm, and directed the administration of suitable medicines. The tumour of the liver gradually disappeared after a few days, when the man was seized with pain in the region of the heart, accompanied with difficulty of breathing. A small quantity of blood was again withdrawn, by which the respiration was somewhat relieved, but the state of pulse was only improved in a slight degree—indeed it was so small and languid, in the temples as well as at the wrists, as to be scarcely perceptible. I applied my hand to the left side of the chest, and found that the heart beat with equal frequency, and with moderate power. The action of this organ was sensibly felt much below the region it occupies. It seemed to labour, and the patient solicited what are commonly termed cordial medicines. About the eighth or ninth day after coming into the hospital he died suddenly.

Dissection. The pericardium contained a large quantity of a yellowish serum; and from enlargement, as well as the accumulation of fat on the heart, that organ was the most unsightly I had witnessed. The small vessels of the lungs were black, and distended with blood; the texture of the lungs, between the vessels, was whitish, except at the upper part, where, both externally and internally, the tissue was black and extremely indurated; and when cut into a thickish fluid of a tobacco colour issued from it.

The liver was indurated and marbled; and not only exhibited small white spots, but some also which were of the colour just mentioned. The coats of the gall-bladder were black, and that receptacle contained bile which in colour resembled ink, although the contiguous pylorus and duodenum were tinged yellow.—*Morgagni*, xxiv. 13.

It is probable that the parietes of the gall-bladder had become gangrenous; and if so, the pain, which in the beginning had affected the right hypochondrium, may be ascribed to the preceding inflammation. It might have arisen, however, from the mere dilatation of the vesicle, which, conjointly with flatus in the subjacent intestine, would explain the tumour that had been perceived.

When writing on the subject of dropsy of the pericardium, this kind of pulse will not be mentioned amongst the characteristic symptoms, because I shall then only adduce those which distinguish that disease from others; nevertheless, cases of effusion into that capsule have been

attended with an extremely small, a languid, or creeping pulse.—14.

An enlarged heart is often joined with a strong and vibrating pulse. In some of the cases of this nature which have been adduced, there was nothing which obstructed its action—there was no fluid in the pericardium, and the parietes of the ventricles were thick: but the heart may acquire increased magnitude from laxity of its fibres, and the pulse become so weak as scarcely to be felt.—15.

Neither a slender nor a weak pulse, however, so nearly approaches asphyxia as an intermission; indeed, this may be considered as a transient asphyxia, and ought not to be passed over without notice in this place, because it generally excites some alarm in the mind of the physician. Sometimes apprehension may justly be awakened, yet frequently there is no occasion for it, as is the case when the cause is seated in the stomach and intestines, whence it may either disappear of itself, or be easily removed. Flatus distending these viscera has an influence in bringing it on; at other times morbid secretions accumulate in them, and produce the same effect, by irritating the nerves, with which it is well known the nerves of the heart very readily sympathize. When attending a maiden who laboured under fever, an intermission of the pulse was conjoined with the other symptoms; but I was not deterred from administering such medicines as I had previously determined upon, that the stomach and bowels might be well purged; and on the same day, when that object had been

thoroughly effected, the pulse returned to its former standard. In the Sepulchretum it is recorded that Ballonius had not only seen this affection of the pulse, but that he had also witnessed the removal of its languidness and smallness by a similar process. He says, "*pro gradibus purgationis pulsus restitue-* "*batur.*" There is, indeed, an intermission of the pulse of much longer duration, and Lancisi writes that he was affected with it for six years. Whenever it originates, as Lancisi reports it to have done in his case, "*ex hypochondriorum consensu,*" it may be entirely removed by perfectly restoring the viscera in those parts.*

Effects similar to those which arise from the nerves being irritated in the hypochondria may be produced from their irritation in any other part. In the following instance the intermission was maintained by anxiety of mind. An intelligent professor of physic at Bologna happened to discover that his pulse was intermittent, and being extremely anxious respecting it, as if it were impossible that it should occur from an accidental cause, he was often applying his fingers to his wrists; and he

* Probably the stomach and liver were the organs chiefly affected. I am now attending a case in which the patient, a gentleman thirty-six years of age, is occasionally seized with intermission in the action of the heart, and transient sensations of deliquia. These attacks are invariably accompanied with the usual symptoms of dyspepsia, and are removed by taking two or three alterative doses of mercury. But functional diseases of the heart do not exclusively arise from sympathy with the organs of digestion; I have observed it affected in a very extraordinary manner, as I have already mentioned, from sympathy with the uterus during abortion.—*Ed.*

perceived with deep concern that the intermission was constantly increasing. I advised this gentleman to apply his finger much less frequently to the pulse; and when he had followed my advice, the anxiety of his mind diminished, and the intermission soon became less observable, till, at length, not attending to it, the affection wholly ceased.

I have likewise observed that not only the nerves distributed to the heart, but that those also which are subservient to the arteries, or their contiguous muscles, may vary the action of these arteries. The patient in whom I observed this circumstance had but just escaped the peril of a violent disease, when his mind was deeply distressed by the reception of unpleasant intelligence which had been communicated to him at this unseasonable moment, and his distress was aggravated by his efforts to disguise it. At a period when I had no reason to expect such an occurrence, I found the pulse in both wrists beating with every kind of irregularity, but on the following days the inequality was confined to the left arm. As the pulse was perfectly regular in the right arm, it was evident that the cause related only to the left brachial artery; and that vessel soon regained its natural action when the mental distress was alleviated, and the nerves returned to their proper functions.—20.

The influence of the nerves in the production of inequality in the pulse has been elucidated by the celebrated Molinelli in the third volume of the Commentaries of the Institution of Sciences at Bologna. He tied the par vagum on one side of the neck of four dogs, and did not immediately

untie them, as Valsalva was accustomed to do when he performed this experiment. He soon observed in all of them, that the action of the heart was irregular and intermittent, and in one of them, in which he divided the nerve, he remarked that the action of the heart was excessively confused. The heart did not regain its usual regularity in these dogs, before the seventeenth, the twenty-ninth, twenty-third, and the twenty-seventh days. Therefore if any considerable injury happen to this nerve, or to any other connected with the heart, the consequence of that injury is manifest; and in the brain, or the nerves, lesions which are irremediable, and consequently endure many years, or even till death, frequently occur. But as these lesions are not, in general, evident to the senses, it should not excite surprise if we are unable to detect the cause, after persons have been affected with a variously unequal pulse, either with a disorder of the heart or not. For although the diseases of the heart cannot speedily alter in their appearance, yet the lesion of the nerves, whence the peculiarity was derived, might be undiscoverable.—29.

When intermission of the pulse does not arise from obstruction, or irritation in any other part, but from a cause existing in the heart itself, or in the neighbouring trunk of the aorta, or in both, then it must be considered as a symptom of importance. It has been occasioned by disease in the semilunar valves, and also in the tricuspid and mitral. Horstius found a deposition of calcarious matter in the tricuspid valves equal to the size of a small chestnut, and Bellini a similar deposition

in the mitral valves, after intermission of the pulse: and the former of these anatomists, after that symptom, found a kind of putrid humour in the pericardium, and the heart was enlarged to double its natural size. Cowper and Vieussens generally found ossification of the valves, and dilatation of the left ventricle, when the fatal catastrophe had been preceded by an intermittent or unequal pulse.—21.

Irregularity of the pulse has been ascribed, in a great measure, to polypi; but the writings of Pasta are sufficient to induce a doubt whether polypi are ever formed in living bodies, except in cases of aneurism. I believe, however, that they may begin to form in dying persons, or during very protracted syncope: but we have already spoken on this subject.—30.

Sometimes there exists an extraordinary *slowness of pulse.* An instance of this nature has been related.* In another old man, who had been attacked with epileptic paroxysms, which commenced in an abdominal affection, I found the pulsations only amounted to two and twenty in a minute, and this sluggishness had existed for several months, though the man was able to walk about like a healthy person. In a boy who had injured his back by falling from a tree when he was twelve years of age, and who, during nine years, had suffered frequent palpitations of the heart, with difficulty of breathing, of which he had exacerbations three or four times daily, I found, at the termination of this period, both radial arteries pulsating irregularly and unequally; but whilst the

* Page 109.

left was natural as to frequency, the right was scarcely above a third the frequency of the former.

The opposite condition, namely, extreme violence of pulsation, sometimes arises from causes which are manifest to the senses. It has already been said that this state of pulse may be one indication of incipient aneurism of the heart and aorta.—33.

Syncope.

It has been shown in the preceding article, that asphyxia may exist independent of syncope, but the latter cannot take place without being accompanied with the former. Lipothymia differs from syncope only in degree. The preceding observations exhibit some of the causes of fainting fits, namely, aneurism of the heart and of the aorta; ulceration of the heart, and diseases of its valves; and ossification of the falx: but it may arise from a variety of other causes.—*Morgagni*, xxv. 1.

Case 1.

Syncope from effusion of serum into the brain; deficiency of one kidney.

A priest sixty years of age, for thirty years had been incommoded by weakness of the head and stomach, accompanied with thirst and sudden deliquia, especially when he was standing. He also experienced a sense of constriction of the thorax, and the pulse was intermittent: he became affected with continued fever, which daily acquired a more ardent form, and proved fatal.

Dissection. The omentum was large, and twisted like a rope: the right kidney was wanting, nor

were there any traces of renal vessels on that side: the left was of a natural size, and exhibited an hydatid upon its surface.

The ventricles of the brain contained a considerable quantity of fluid, and the glandules of the choroid plexuses were exceedingly tumid.

Valsalva, xxv. 4.

It does not appear possible to explain the tendency to swooning in this man, without a reference to nervous agency, as no morbid appearances were discovered, except in the brain and abdomen, to which the cause could be referred; and the nerves, when compressed at their origin, or irritated in any other part, are frequently and evidently the cause of syncope. This circumstance is obvious from the numerous instances in which swooning has been produced, when persons were suddenly affected with certain passions of the mind, annoyed by unpleasant odours, or seized with pain in nervous parts, and especially in the stomach. In consequence of nerves being subjected to irritation the functions of the heart have not only been disturbed, or its powers diminished, but its action has been wholly interrupted.—*Morgagni*, 5.

Case 2.

Syncope from hydrops pericardii; an hydatid on the heart.

A monk had experienced numerous symptoms of impaired health, and had been particularly subject to defectiones animi, and under these circumstances, terminated his existence.

Dissection. The pericardium, though partially

adherent to the heart, was full of serum; and from the basis of the heart a large hydatid was suspended.—*Morgagni*, xxv. 15.

In another place I shall speak of the accumulation of fluid in the pericardium from the rupture of hydatids; and the tendency to swooning in cases of dropsy of this capsule, will then be noticed.—16.

Hydrothorax and hydrops pericardii.

Serous effusion within the thorax is the principal cause of dyspnœa existing within the chest, but exterior to the lungs.

Case 1.

Hydrothorax; preternatural track of the colon.

A woman seventy years of age experienced difficulty of respiration, and inability to assume any decumbent position except upon her back. She had a slight cough, expectoration of mucus, and considerable thirst. Her pulse sometimes was scarcely perceptible; and the right foot had become œdematous. Previous to her decease she vomited fluid of an eruginous colour.

Dissection. On opening the abdomen the colon was found inflected downwards quite to the pubis, and reflected to its usual situation. The stomach contained a fluid similar to that which had been vomited. Each thoracic cavity was occupied by about three pints of serum, and the anterior part of each lung adhered to the costal pleura.

Valsalva, xvi. 8.

Case 2.

A pallid woman fifty years of age, had laboured under dyspnœa for twelve months; and as the

disease increased, she was received into the hospital of St. Mary de Vita at Bologna. Respiration was exceedingly laborious—her thirst urgent—and her pulse moderately quick and small, but it daily became increasingly feeble, and she died.

Dissection. The abdominal viscera were perfectly healthy. The left lung was sound, and free from morbid connexions; but the left cavity contained a pint and half of a saltish fluid. The right lung, on the contrary, adhered so closely to the pleura costalis as to appear continuous with it.

Valsalva, xvi. 14.

We may ask whether the urgent difficulty of breathing in this case, from so comparatively small a quantity of fluid, was induced from its being impregnated with saline particles? Albertini inculcated that doctrine. Adhesion between the pleura pulmonalis and the pleura costalis exists in a greater or less degree in almost all bodies, and I do not think that, in itself, it is the cause of any difficulty of respiration. Indeed sometimes the lungs are attached not only to the ribs, but also to the diaphragm and mediastinum, without being accompanied with any dyspnœa.—*Morgagni*, 15.

Case 3.

Hydrothorax, with enlargement of the liver.

A woman about twenty-six years of age, who had been repeatedly pregnant, observed, after considerable mental perturbation, that her whole body slightly swelled; but the degree of tumefaction was the most considerable in the abdomen. Her respiration was difficult, and was performed with

the neck upright, for the dyspnœa was augmented by decumbence on either side. She also experienced a sensation of weight in the thorax, and her thirst was urgent. The function of respiration, at length, became more oppressed, and she died.

Dissection. There was but little fluid in the abdomen, but in consequence of the stomach being turgid, and the liver of a large size, the diaphragm was forced upwards, and the capaciousness of the chest was of course diminished. The lymphatics in the abdomen were turgid, and the ovaria indurated.

The thorax was entirely filled with fluid; the lungs were somewhat red, and slightly indurated; and were diversified with black spots.

Valsalva, xvi. 4.

Case 4.

Hydrothorax from pleurisy; the liver somewhat diseased; an artery in the pancreas ossified, and containing lymph.

A corpulent woman, seventy years of age, and of a sanguineous temperament, was seized with pleurisy; but, at the expiration of several days, she recovered from this attack, without any expectoration. Immediately afterwards, however, she noticed a sense of great oppression in the left district of the chest, so that she was unable to respire when in bed, unless she lay upon the right side. She expectorated a catarrhous matter, felt exceedingly thirsty, and the legs were tumid. At the expiration of four months she had an accession of diarrhœa, which continued for three months. During the whole of this period she experienced a

periodical recurrence of fever, denoted by rigor, heat, and pain in the head; and all the symptoms continuing, she died at the expiration of seven months from the commencement of disease.

Dissection. The liver was of a somewhat cineritious colour, but in other respects healthy. The coats of an artery in the pancreas had acquired an osseous hardness, and at the commencement of it some coagulated blood existed, but in another part there was only coagulable lymph.

There were no traces of morbid structure in the right cavity of the chest, but the left was replete with serous fluid, in which some filaments were suspended. The lung was a little flabby.

Valsalva, xvi. 12.

In general, persons can lie most easily on the side that is filled with water, and its being otherwise with this woman may perhaps be accounted for, either from the mediastinum having sufficient power to sustain the weight of the incumbent fluid, or from the opposite lung being able, as it was exempt from lesion, to endure that diminution of its space which resulted from the accumulation of water in the left cavity.—*Morgagni*, 13.

Case 5.

Hydrothorax, unattended with some of the usual symptoms.

A man who resided at Bologna experienced difficulty of respiration. He was unable to lie upon the left side, but constantly maintained a decumbent position on the right. He did not require the head to be elevated—his feet were not

œdematous—nor was he ever awaked, during the first hours of repose, by a sense of suffocation. He complained of some hardness in the abdomen, which was even perceptible to the hand; and from the situation it occupied was likely to excite a suspicion that the pancreas was indurated.

Dissection. When the abdomen was opened it was found that the tumour had been formed by the liver. For although the texture of this organ was healthy, it was depressed by the diaphragm, in consequence, as was afterwards discovered, of an accumulation of fluid in the right thoracic cavity. That portion of the diaphragm which was forced downwards had lost its fleshy appearance.

The serous effusion into the right cavity had been so excessive, that not only had it pressed down the diaphragm and liver, but it had also forced the mediastinum greatly to the left side, notwithstanding the augmentation of its thickness.

Morgagni, xvi. 26.

I have heard of instances in which the diaphragm has been so depressed by enlargement of the right lung, that the liver has been mistaken, by physicians, for a tumour. And from a redundance of serous fluid accumulating in the left cavity, the diaphragm, in the part where it is perforated by the œsophagus, has been said to protrude like a sac towards the left kidney, so that the stomach was forced upon the liver.

It will be apparent what symptoms of hydrothorax were absent in this case, yet he experienced some difficulty of respiration, and was only able to lie on one side. On some occasions there

has been an exemption even from these symptoms. Ruffius has related that the whole thorax of a maiden was filled with fluid, yet to the time of her death she was free from difficulty of breathing. And Wepfer says of a young man, that although the right cavity of the chest contained three pints of serum, and the pericardium one pint, yet to the last moments of life he was able to recline with his head in a low position, and could ascend an acclivity nearly at a running pace, without any impediment. To these cases I shall subjoin an instance communicated to me by Mediavia, in which, though the chest was full of water, the two symptoms which existed in the preceding case, and the other signs which are chiefly relied upon as diagnostic of hydrothorax, were wanting. —27.

Case 6.

Hydrothorax, unattended with all the usual symptoms.

A clothier of middle age and of a spare habit, had received a wound on his scapula with a knife, so that a finger might be passed through the broad part of the bone. Suppuration between the transfixed bone and the ribs ensued, and the matter was discharged by an artificial dependent opening. It was uncertain whether the wound had penetrated the thorax; for though the sputum had been tinged with blood, it was not sufficiently obvious whether it might not rather be attributable to some pre-existent lesion than to the wound, especially as all the other symptoms which usually arise from wounds penetrating this cavity were absent. He could assume the decumbent

position on either side, and with his head low; and he never experienced any difficulty of breathing from the time when the injury was inflicted. Towards the close of life the pulse was hard and small.

Dissection. There was a large sinus beneath the scapula, but no communication existed between it and the cavity of the chest. Both the cavities, however, were filled with serum of a yellow colour. The lungs had contracted adhesions of some extent to the costal pleura; and that part of their surface which is contiguous to the diaphragm was covered with a kind of gelatinous substance. When this was wiped away, and the texture of the viscera inspected, they did not betray any essential morbid appearance, though their aspect was not perfectly healthy.—*Morgagni*, xvi. 28.

I apprehend that the accumulation of fluid in the thoracic cavities commenced before the reception of the wound, and that it had increased during the man's continuance in the horizontal position, especially as he had previously been habituated to exertion. All the principal symptoms of this dropsical affection were absent. Therefore we shall not be surprised to find, on other occasions, that some of the usual indications do not exist.*—29.

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* I recently inspected the body of a woman who had long suffered from organic lesion of the abdominal viscera, but her respiration, till within a short time of death, had never been more urgent than the abdominal disease appeared to explain, and she was at no time invaded by any sense of suffocation. Though during a few days before her dissolution she preferred reclining upon her elbow,

Case 7.

Hydrothorax, with a tuberculated and thickened pleura, and tuberculated peritoneum and omentum: the pulsations of the heart and arteries unequal.

A little before the close of the year 1704, a lad experienced some difficulty of breathing, which arose without any evident cause. He was received into the hospital of St. Mary de Morte, and different methods of treatment were employed, but without success. He was repeatedly bled, and the dyspnœa was alleviated for a time by this means; but though purgative medicines did not appear to be injurious, he was not benefited by them in the slightest degree. These circumstances were related to me when I first saw the patient, which was scarcely three days before his death. He was then pallid, and the state of his respiration constantly required the erect position. During the act of inspiration I observed that the lower part of the chest was greatly elevated. He had

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yet to the last she was able to lie horizontally. She had ascites and a diseased liver; and the legs became anasarcous.

Dissection. The chest was full of fluid, which at the top was of a yellow colour, but the lower portions were exceedingly bloody. From the left cavity I removed nearly six pints of fluid, and from the right upwards of four. The left lung was compressed into a space not exceeding the extent of a hand when laid flat; the right lung was compressed into a small bulk, though not so small as the left. The texture of these viscera did not appear to have sustained any lesion except condensation from pressure. The costal pleura was extensively livid, and I presume that the blood had been extravasated from the turgid vessels of this membrane.—*Ed.*

no thirst, the temperature of the skin was not hot, nor had he any other indication of fever. The arterial pulsation was frequent, but, when the hand was applied to the chest, the palpitation of the heart appeared to be much more frequent than the pulsations of the arteries. This comparison was repeatedly and attentively instituted, and the contrariety I have mentioned was uniformly observed. The actions of the heart and arteries were astonishingly unequal. The difficulty of breathing having greatly increased, he died about the hundredth day from the commencement of the disease. At the time of his decease the face was swollen, but the feet were not œdematous.

Dissection. The face was still tumid, and there was a degree of lividness about the eyes and abdomen. The omentum appeared to be of a blackish colour, and both its surfaces were covered with globular bodies like glands. The liver was externally white, and internally it approached a tobacco colour. It had contracted unnatural adhesions to the adjacent parts, especially to the septum transversum. The peritoneum also, where it invests the diaphragm, was rugged from globular substances, which varied in their size and figure. The abdominal cavity contained a redundance of serous fluid of a yellowish green colour.

Both the thoracic cavities were filled with fluid like that effused into the abdomen, and flakes of lymph, resembling thin membranes, floated in it. The right lung adhered to the costal pleura, and the posterior part of this membrane presented an

appearance like ecchymosis, and the blood extravasated here was of a crimson hue. The left lung, at its upper and lateral parts, was firmly annexed to the pleura, which in those places, and also the pleuritic covering of the subjacent diaphragm, and of the anterior part of the mediastinum, was not only beset with round bodies similar to those which pervaded the peritoneum, but the membrane had acquired a degree of hardness and thickness which exceeded the density of the coats of the aorta at its origin. The internal texture of the pleura consisted of a white substance, made up of minute particles. When the lungs were compressed they were observed to be full of frothy ichor. The pericardium scarcely contained more fluid than is usually found in that bag, but the fluid exhibited the same appearance with that which occupied the other cavities.—*Morgagni*, xvi. 30.

It is difficult to determine the cause of the appearances which presented themselves in the pleura. Hippocrates and Galen entertained the opinion, that serous fluid may be accumulated in the thorax and pericardium from ruptured hydatids, which had been observed in the ox, the dog, and the sow; and from their existence in these animals it was inferred that the human body was liable to them, in a ratio of increase proportionate with its greater tendency to disease. To these ruptured hydatids Hippocrates attached the appellation of *tubercles*. It is well known that similar appearances are often seen in sheep and oxen. They have fallen under my observation in brutes and in the human subject. In a sow that was, in other

respects, healthy, I saw an hydatid, which though but slightly prominent on the surface of the lungs, was so large internally as to contain some ounces of a limpid fluid. In cases of water in the chest, Fallopius found hydatids attached to the abdominal viscera; and in one of these patients he discovered an hydatid adherent to the side of the cervix uteri. It was so large as to be nearly double the size of the urinary bladder, and full of a thin and pellucid fluid. Therefore it is natural to conjecture, that the water in the chest had been discharged from similar ruptured vesicles. The lungs have been discovered full of vesicles, which, being opened, water, or a pellucid humour, issued from them, and its escape before death had occasioned a dropsical affection of one cavity of the chest.

I do not believe, however, that hydatids are generally the cause of hydrothorax; for this accumulation of fluid may arise from peripneumony, pleurisy, and consumption; or it may be associated with other dropsical affections.—33.

Case 8.

Hydrothorax, with effusion into the ventricles of the brain.

A young woman had been distressed with cough, thirst, and a difficulty of breathing, for a long time, but she experienced the greatest oppression from these symptoms during the last few nights of her life. Sometimes, by coughing, she expectorated mucus. Decumbence on the left side was impracticable, on account of the sense of constriction in the præcordia; but she could lie upon the contrary

side. Her face and feet were œdematous; and the abdomen was slightly tumid. About three days before death there came on a degree of somnolency with tardiness of speech; and, during the last two days, her pulse was imperceptible.

Dissection. Three or four pints of fluid had been effused into the cavity of the abdomen. The liver was somewhat pale. There were scarcely any traces of lymphatic vessels in the abdomen.

The texture of the lungs was healthy, but the right lung was closely adherent to the costal pleura. A small quantity of serous fluid existed in the left cavity of the chest; but on the right side, wherever the lungs were unconnected with the pleura, the space was filled with a yellow serum. The ventricles of the heart contained fluid blood.

The lateral ventricles of the brain were occupied by a redundance of serum, which was slightly tinged with blood. When this fluid was placed on the fire it deposited a thick matter, but totally evaporated. The fluid which was taken from the abdomen and thorax, being exposed to the action of heat, became turbid, and then passed off in vapour, leaving no residue except a somewhat glutinous pellicle.—*Valsalva*, xvi. 10.

This woman was unable to assume the decumbent position on the left side, because respiration was chiefly performed by that lung. She experienced increased difficulty of breathing in the night; and if a patient, in whom the other signs of thoracic effusion exist, is suddenly roused from his first sleep with orthopnœa, it cannot be denied

that he has water in the chest. This symptom, however, is not of itself diagnostic, for large effusions sometimes take place without the accumulation being indicated by this sudden excitation from repose; and Willis has shown that nearly the same occurrence takes place when the lungs are compressed from other causes, by which the transmission of blood through them is interrupted. This may happen from diseases of the lungs; and also from affections of the heart, the pericardium, and the aorta: and an imminent sense of suffocation occasionally arises from spasmodic attacks. Therefore although this symptom cannot be implicitly relied upon, it will assist our diagnosis when combined with other indications.

Morgagni, 11.

CASE 9.

Hydrothorax, with hydrops pericardii; the fluid in one cavity coagulable, and in the other not so.

A cachectic woman twenty-two years of age, having thirst and a slight cough, attended with mucous expectoration, entered the conjugal state. Some days afterwards decumbiture became necessary. The pulse was quick, frequent, and low; and her thirst was urgent. The cough was troublesome, and was accompanied with but little expectoration. Her feet were œdematous, and the tumefaction extended as the disease advanced; so that the face, arms, and hands, became anasarcous, as well as the feet. In the left district of the chest she experienced a sensation of excessive heat; and sometimes she felt constriction at the præcordia, with dyspnœa, so that as the disease

increased she was unable to respire except with the neck erect. A few days afterwards she died.

Dissection. The abdomen contained but little serum, and all the viscera were in a healthy state except the spleen, which had become somewhat enlarged. The uterus was examined, to ascertain if there existed any rudiment of conception; and two vesicles, with a kind of unformed and unadherent mucous mass, united with something like coagulated blood, were found within the cavity of that organ. One of the vesicles was about the size of a small lentil, and the other that of a small vetch. They were firmly adherent to the parietes of the uterus, but did not evince any vascularity; nor did the fluid they contained coagulate by heat. However, the ova, or vesicles of the ovaries, consisting of double membranes, not only exhibit blood-vessels, but the included humour is coagulable, and resembles albumen. This congelation of the fluid of the ovarian vesicles took place in the woman whose case is before us. The entrance of one of the Fallopian tubes into the uterus was obliterated.

The lungs were unadherent to the costal pleura, but their texture was hard. The thoracic cavities were so replete with serous fluid that it burst forth on dividing the sternum; and about five ounces of a similar fluid were contained in the pericardium. There existed this difference, however, between the thoracic aud pericardiac liquors, that on being exposed to the action of heat, the former coagulated, but not the latter.—*Valsalva*, xvi. 2.

Case 10.

Hydrothorax and hydrops pericardii, with enlargement of the heart and spleen.

A man nearly forty years of age, had for many weeks laboured under slow fever, conjoined with tumefaction of the feet, an irritating cough, and dryness of the fauces. His respiration was short and quick, and required the erection of the neck. The pulse was scarcely perceptible; and he died suddenly.

Dissection. Whilst dividing the abdominal integuments, a serous fluid issued from the left part of the umbilical region. All the abdominal viscera were in a healthy state except the spleen, which was enlarged to three times its ordinary bulk.

Both cavities of the thorax contained a limpid fluid, which, being set by, in a glass vessel, at the expiration of some hours had deposited a sediment, in separate portions, which fell to the bottom of the vessel. The liquor did not exhibit that floating and condensed cloud which is usually observed in fluid taken from the thorax. The pericardium was dilated, and contained more than half a pint of a pellucid serum. The heart was enlarged.

The thoracic duct, and the lymphatics in the abdomen, were so empty, that not a vestige of them could be discovered.—*Valsalva*, xvi. 6.

Case 11.

Hydrothorax and hydrops pericardii; ulceration of the heart.

A maiden fifteen years of age was affected with acute fever, but she was more particularly distressed

from excruciating pain in the head. About the tenth day the febrile symptoms were mitigated; but a few days afterwards, in addition to the fever, she experienced considerable thirst, and difficulty of breathing, accompanied with pain in the left side of the chest. The dyspnœa and pain in the chest became increasingly oppressive within a few days, and she expired.

Dissection. The lungs were healthy, but the left cavity of the chest was full of serum, in which some concretions floated, which bore a resemblance to hardened albumen. The right cavity likewise contained a redundance of serous fluid, but it was small in quantity. The pericardium was replete with fluid, which was somewhat thicker than that which occupied the thorax; and the surface of the heart was slightly eroded.—*Valsalva*, xvi. 17.

Case 12.

Hydrothorax and hydrops pericardii.

A maiden twenty-two years of age experienced so much difficulty of breathing that she could only respire when the neck was upright. She had a considerable degree of thirst, and also a troublesome cough, with which she expectorated a kind of purulent sputum, sometimes tinged with blood. These symptoms were accompanied with fever, the face swelled, and, at length, she died.

Dissection. The abdominal viscera were healthy, but some pints of fluid pervaded the abdomen. The right cavity of the chest was full of serum, and a smaller redundance existed on the opposite side. The lungs appeared in a healthy condition,

but in some places they were of a ruddy complexion, and in others white. The pericardium was filled with a serous fluid. The heart contained nothing except fluid blood.

Valsalva, xvi. 19.

The cases of hydrothorax, as well as those of hydrops pericardii, which I am about to subjoin, tend rather to unteach than to teach us; but this is not without its advantages. Those who have dissected or examined numerous bodies, have learned to hesitate in the exercise of their judgment; whilst others who are ignorant of anatomy, and do not trouble themselves with pathological researches, cherish an unwarrantable degree of confidence.—25.

Case 13.

Hydrothorax and hydrops pericardii; the liver diseased; and the mammæ sympathetically excited.

A maiden residing at Bologna, about eighteen years of age, having been affected with scabies, which she had removed by inunction, was assailed by a most violent orthopnœa, unaccompanied with fever. Six or seven ounces of blood were withdrawn from the arm, but she became much worse; and about the same quantity having been taken from the foot some days afterwards, the powers of body sunk, respiration was performed much more laboriously, and she died on the following day.

Dissection. There was no tumefaction of any part of the body, nor any vestige of scabies. The liver was of a livid hue, and its texture somewhat

indurated. The upper portion of the spleen was nearly disjoined from the remainder of that viscus, so that, had there not existed a small lateral continuity, there would have been two spleens. The hymen was entire, and the uterus was perfectly natural, although the cavity of this organ abounded with a somewhat glutinous secretion, which resembled water in which fresh meat has been washed. When this was wiped away, and a little pressure made with the fingers, some bloody points appeared on the inner surface, but chiefly in the middle of the fundus uteri; and on the pressure being increased they became small drops of blood. In different parts of this surface there was an appearance of sinuses turgid with blood; so that I had no doubt these were the indications of approaching menstruation.

Whilst dissecting the thorax I made incisions into the expanding mammæ, and was surprised when, at several points, milk burst from them with a degree of impetus. As soon as the scalpel had punctured the chest, fluid having a bluish tint issued from the cavity, and the thorax was discovered to be filled with it. When the fluid had been removed I found that only a portion of the left lung, at its posterior surface, adhered to the pleura; but the right lung was closely united to that membrane through the whole of its posterior and lateral surfaces. The pericardium was rendered so exceedingly tense by the fluid it contained, that, previous to cutting into that capsule, I supposed that the heart must be exceedingly

enlarged; nevertheless, this viscus was of its natural size. The girl had always reported the head to be exempt from pain, and therefore the brain was not examined.—*Morgagni*, xvi. 34.

Case 14.

Hydrothorax and hydrops pericardii, with effusion into the head: a polypus in the stomach.

A woman in the fiftieth year of her age had for several days been affected with difficulty of breathing, accompanied with wheezing; but the dyspnœa was not so severe as to prohibit decumbence, or to prevent sleep. One of the arms was painful and anasarcous, a circumstance which Fantonus, Buchnerus, Valsalva, and others, have observed in cases of thoracic dropsy. She remarked, that on the motion of the thorax a sense of fluctuation was perceptible; but she experienced a sensation of weight independent of motion. Three or four days before death the feet became œdematous, without any increase of dyspnœa. She died suddenly, having never been affected with syncope, straitness, or constriction at the heart, pain in the loins, or any gastric disorder.

Dissection. The stomach was contracted, and contiguous to the pyloric orifice we found a caruncle of considerable size, attached by an oblong pedicle to the inner coat. Its exterior aspect was the same as that of the membrane to which it was united, but internally it was constituted of a soft substance, having a palish red colour, and more like one of the mesenteric glands

when impregnated with chyle, than any other body with which I could compare it.

Both cavities of the thorax were occupied by a large quantity of a greenish fluid; and the pericardium contained nearly two pints of a fluid having a bloody appearance; but this colour might owe its origin to a delay of some days in opening this capsule. The heart was nearly covered with a rather thick accumulation of fat.

When the cranium was opened, serum was found to be deposited between the membranes of the brain, and in the ventricles.—*Morgagni*, xvi. 36.

Though it was evident, during life, that serum had been effused into the thorax, yet some of the symptoms which usually denote thoracic dropsy were absent. If in these cases a sense of fluctuation was constantly perceived, we might dispense with other symptoms when there had been no probable cause of suppuration; but although fluctuation is sometimes made apparent to others as well as felt by the patient, yet it does not uniformly exist, and indeed cannot occur when a large quantity of fluid is accumulated.—37.

In the two following instances there was likewise a deficiency in the characteristic marks of thoracic effusion.

Case 15.

Hydrothorax and hydrops pericardii; central contraction of the stomach.

The subject of this case was a pallid country woman, not much above twenty-five years of age. She had been married four months, and the uterus

had become impregnated upwards of three, when she was received into the hospital at Padua with a species of erratic fever. Her pulse was neither small nor intermittent; nor did she experience thirst. There was no œdema of the feet—no syncope—no sense of constriction or of anxiety in the region of the heart—nor of oppression or any other inconvenience in the thorax. She was indeed, affected occasionally with a slight dry cough, to which she had been accustomed for a long period; and, whenever she took any thing hot she was seized with dyspnœa. Independent of these attacks she breathed freely, and was never roused in the night with any menace of suffocation. She lay upon the right side. Without any accession of disease except pain in the loins, in addition to the slight febrile affection, she expired. This event occurred at the close of November 1724.

Dissection. The body being opened half an hour after the fatal issue, the fœtus was found to be alive, and it did not expire till an hour after the mother's decease.

The spleen was somewhat enlarged; and the liver had acquired such an augmentation of bulk that it descended lower than usual, and likewise extended across the abdomen to the spleen. The surface of the liver was pale; and internally, this organ was variegated with its natural colour and the colour of tobacco. There was a central contraction of the stomach, and numerous round worms pervaded the small intestines. In those parts where they lodged, the coats of the intestines

exhibited a reddish appearance, and in one of these places, the canal appeared as if it had been dilated by force.

The neck was tumid from an enlargement of the thyroid gland; and milk could easily be squeezed out of the mammæ.

The right cavity of the thorax contained a large quantity of a yellowish serous fluid, in which portions of coagulable lymph were suspended. There was a redundance of serum also in the left cavity, and the pericardium was nearly filled with a similar liquid, sustaining portions of lymph.

Morgagni, xvi. 38.

Case 16.

Hydrothorax and hydrops pericardii, with effusion into the head.

A man upwards of forty years of age, who frequently travelled on foot with goods from Imola to Bologna and back, was accustomed to drink when heated, and more particularly during the latter period of these exertions, when he experienced constant thirst. At length he was seized with violent fever, accompanied with excessive secretion from the fauces, and was taken into the hospital at Bologna. The affection of the fauces soon disappeared, and then he referred to the abdomen as the seat of his disease; but he also complained of a violent pain in the lumbar portion of the spine, which, he said, felt as if it had been undergoing division. Some of the physicians who saw the patient, considered him to be labouring under enteritis, but Valsalva entertained a suspicion that the symptoms arose from thoracic disease.

The pulse was weak and low, and appeared to be oppressed. He often arose, as if he purposed going away. On the third or fourth day after coming into the hospital, he died.

Dissection. All the abdominal viscera presented a healthy appearance; but within the thorax, especially in one part of this cavity, there existed an accumulation of serous fluid, in which perfectly white and thin flakes of lymph were suspended, so that the fluid resembled whey, which retained small particles of the second sort of curd. The vessels of the pleura were somewhat redder than ordinary. The pericardium was so exceedingly distended, that on being pricked, the fluid was ejaculated to a considerable height in a small stream like a fountain. The apex of the heart was a little more florid than usual, and appeared to have been slightly inflamed.

When the cranium was opened, a copious deposition of serous fluid was found to have taken place between the dura mater and pia mater. The vessels ramifying through the latter membrane, circumvesting the brain, were exceedingly turgid with blood; but there was no plethora of vessels in the membrane of the ventricles. The basis of the cerebrum, and the adjacent cerebral substance, were flaccid.

Morgagni, xvi. 40.

The state of the brain accounted for the unmeaning rising up, which was a species of delirium; and perhaps the pain in the spine was attributable to effusion into the vertebral canal. From that pain, however, Valsalva conjectured the existence

of disease in the thorax rather than in the pericardium, because he had been accustomed to observe that a troublesome sensation was experienced in that part from the crura diaphragmatis being irritated or compressed.—41.

From some of the cases of thoracic inflammation which have been narrated, and from others which are on record, it is evident, that dropsy of the pericardium, as well as of the thorax, sometimes takes place suddenly, though at other times these accumulations of fluid are gradual.—42.

Dropsy of the pericardium is by no means a rare occurrence when conjoined with other diseases of the thorax, but I do not recollect to have met with it alone; and the circumstance of its seldom existing without complication with other affections, occasions a difficulty in determining upon the symptoms which are peculiar to accumulations of fluid in this capsule. Cases, therefore, in which it has been discovered uncomplicated, merit particular attention; and the following is an instance of this nature.—*Morgagni*, xvi. 20.

Case 17.

Hydrops pericardii.

A man whose feet had long been œdematous was seized with slight fever. His respiration became increasingly difficult every day, so that he was constrained to breathe with the neck upright. He had cough and mucous expectoration, with great thirst. At length he died.

Dissection. When the body was dissected, the pericardium was found to be full of serum.

Valsalva, xvi. 21.

There is great difficulty in discriminating between effusions into the chest and into the pericardium; but the symptoms which have been mentioned as more prevalent in cases of hydrops pericardii are a soft and often unequal pulse, quick respiration, hollowness of the eyes, and palpitation: for though the latter symptom is not peculiar to this affection, and does not constantly attend it, it is not to be disregarded in deciding upon the nature of the complaint. The face is sometimes observed to possess a leaden hue.

22, 23.

Vieussens met with effusion into the pericardium in a boy, independent of other diseases. He had been a lively youth, and his countenance exhibited a good complexion; but he became dejected and slothful, the sprightliness of his eyes decreased, and his lips and eyebrows inclined to a leaden colour. If he walked a little faster than usual, or went up stairs, his respiration became difficult. He was constantly annoyed with palpitation of the heart, and its violence increased. As the disease advanced he lost his appetite, his bodily strength decreased, the extremities were cold, and the feet œdematous. The pulse was uniformly soft, weak, and small, as well as frequent and somewhat unequal. He died under the symptoms of slow fever.

The same author has given the case of a man of a melancholic temperament, in whom this effusion was uncomplicated. He had enjoyed extremely good health till a year before the time at which he began to experience dyspnœa; but the difficulty

of breathing had so increased as to threaten suffocation when he was in a decumbent posture; and therefore, for the space of three or four months, he was compelled to sit up in bed, night and day. He became emaciated, without any œdematous tumefaction, but his extremities were rather cold. His eyes were dull and heavy, his face and lips were of a dark iron-grey complexion; decumbence on either side was equally uneasy to him, but he experienced greater uneasiness when lying on his back. His face, at that time, assumed a darker hue; his pulse became smaller, more frequent, and unequal; and the extremities felt colder than at other periods. He died suddenly.—24.

The accumulation of fluid in the pericardium is sometimes so excessive, that it has amounted to several pounds; and an instance is related in the Sepulchretum in which the distended bag covered almost the whole of the lungs.—25.

The following is one of those unfrequent cases in which dropsy of the pericardium exists without any other apparent disease, and its importance is enhanced from that circumstance. It fell under the notice of Albertini.

Case 18.

Hydrops pericardii.

A nun at Bologna was repeatedly urged, in the month of April, to take some of the syrupus aureus, as an alterative; but as she was enjoying good health she very reluctantly complied with this advice. She did not take a larger quantity than other nuns in the convent, yet, whilst operating

favourably with them, it occasioned her scarcely fewer than fifty alvine evacuations. These discharges produced insatiable thirst, as generally happens after profuse serous excretion, and the urinary secretion was not proportionate to the quantity of liquids which she drank. On the following day, having sat up in bed with an intention to rise, she was suddenly attacked with oppression at the heart, to which deliquium animi succeeded. From this period, whenever she spoke or moved too much, the sense of oppression was uniformly aggravated. Several physicians were consulted, amongst whom there was great contrariety of opinion, as is usual in cases of this nature. The month of July had now arrived, and Albertini was united in consultation with the other physicians. However, he cautiously withheld his opinion respecting the case, till he had visited the patient several times; but, after mature deliberation, he regarded it as an instance of dropsy of the pericardium—an affection which had not been mentioned by the other medical attendants. He founded this opinion on the circumstance that the affection arose immediately after a large quantity of fluid had been taken in, which had not been discharged from the body; and also, because on dissection he had found a redundance of fluid in the pericardium, after symptoms which resembled those existing in this patient.

The countenance retained its natural complexion; her sleep was undisturbed; the intestinal excretions, and the catamenia were regular; and her respiration was equally easy whether she stood

up, or assumed the decumbent position on her back, or on either side. Her pulse was neither tense nor hard, nor was it vibrating, or in any respect unequal. She had no palpitation or violent pulsation in the thorax, nor any cough; and she was free from pain in the region of the lungs. When she did not speak, and remained in a state of quietude, she was not even annoyed with the oppression at the heart which has been mentioned; but on exertion, or if she spoke but for a short time, she was immediately distressed with it, and was accustomed to describe the sensation by comparing it with being squeezed in the midst of a numerous concourse of people. A slight degree of syncope always accompanied the oppression at the heart; and even when she was quiescent her pulse was uniformly feeble. Albertini predicted that the disease would terminate fatally, and this prognostic was verified. Her existence had been prolonged to the expiration of a year from the commencement of the disease, when, in addition to the other symptoms, she began to experience a sense of pricking in the affected part. Although but momentary in its duration it frequently recurred, and was accompanied with slight convulsions in the same place. The pulse became increasingly weak, and somewhat obscured—circumstances which indicated approaching death. Albertini was permitted to open the thorax, to ascertain the nature of this anomalous disease.

Dissection. Every part of the chest was found in a perfectly healthy state except the pericardium, which contained nine ounces of fluid. The pleuritic

covering of the heart exhibited slight ulceration, and from this circumstance it is probable that the pricking and slight convulsions had arisen.

Morgagni, xvi. 43.

The quality of the fluid in these cases is variable. When discharged, I have often perceived that it was of a yellow colour, or inclining to a green, a blue, or a white. When any particular particles are prevalent in the serum of the blood, they will predominate in the secretions. This circumstance has been manifest in persons in whom the functions of the kidneys have long been suspended; for the saliva has acquired the colour, taste, and odour of urine.

The fluid of the pericardium in persons who had long suffered under dropsy of that capsule, was found by Vieussens to coagulate spontaneously, as well as by exposure to heat. It rendered the tincture of mallows green, and effervesced with acids. In a case of hydrothorax accompanied with hydrops pericardii, it has already been stated that a portion of the thoracic fluid coagulated on exposure to the fire, but the pericardiac fluid did not coagulate. These varieties, no doubt, are ascribable to the difference of time which had elapsed after the effusion had taken place; and to a diversity in the morbid diathesis of the blood and viscera.

The quantity of fluid which is occasionally contained in the pericardium is almost incredible, and it may originate from a redundance of serum in the blood, or from the circulation in the parts about the præcordia being retarded, either in consequence of lesion in the organs themselves, or from some other cause. But fluids sometimes accumulate

from the rupture of lymphatics, or from the bursting of hydatids; for most anatomists have seen hydatids within the pericardium, and upon the surface of the heart, in the human subject as well as in brutes. I advert to these sources to show, that hydrothorax may vary in its origin as well as in its symptoms.—44.

In reference to the symptoms I might state that Albertini found the pulse small and rather frequent, especially when the largest quantity of fluid had been effused. If we compare most of the symptoms which have been recorded by learned men with the cases which have been narrated or alluded to by me, we shall discover that some of those signs are not constant, and others are not even of frequent occurrence. Swoonings have not been more common, according to my observations, in dropsy of the pericardium than in hydrothorax. A dry short cough, which was generally supposed to be more troublesome in cases of effusion into the pericardium than in effusions into the thoracic cavity, I think is more common in the latter than in the former, in consequence of the contiguity of the fluid to the phrenic nerves, to the lungs, and to the whole surface of the pleura. If fluids secreted into the pericardium are of an irritating nature, they certainly may excite the annexed diaphragm into sympathetic action, although this is not so likely to happen as when the fluid pervades the thoracic cavities, and consequently may act upon the diaphragm through a much more extended space. The difficulty of respiration, I think, is less in hydrops pericardii than in

hydrothorax, in which it is often the chief symptom. When hydrothorax is complicated with ascites, the difficulty of breathing is but very slightly relieved, if at all, when the fluid is drawn from the abdomen. The preceding observations show that this symptom is often extremely urgent, not only when dropsy of the thorax is combined with the same affection of the pericardium, but also in those cases in which there is no effusion into the latter cavity. But on the contrary, numerous cases have occurred, in which the pericardium was distended with fluid, without the disease being attended with dyspnœa. This, however, is not invariably the case, for the breathing is sometimes considerably affected, and decumbence rendered impracticable. Cases occurred to Lancisi in which the breathing was short and difficult, and the patients could only respire whilst they were out of bed; but as the period of death approached, and the fluid had accumulated to the quantity of a pint or a pint and half, the horizontal posture alone could be endured. The inability of supporting the erect position appeared to arise from the pressure made upon the centre of the diaphragm.*—45.

In the Commentaries of the Imperial Academy of Petersburg, Schreiberus has related a case in which the pericardium contained about four pints

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* Dr. Pearson has related a case in which, although the right side of the chest contained three pints of serous fluid, the patient could bear the recumbent posture better than the erect; and could lie upon the left side but not upon the right.—*Ed.*

Ed. Med. Surg. Journal, April 1818.

of a bloody fluid, and was so extended as to fill the middle and anterior parts of the chest, yet when the greatest difficulty of breathing had come on, the patient could not lie upon either side, but decumbence on the back was tolerably easy to him. He expectorated a white viscid matter, mixed with a considerable quantity of blood. He experienced no palpitation, faintings, or orthopnœa, but had oppression at the chest, and a constant dry cough.

Anasarca of the feet is considered as one of the symptoms of hydrothorax, and it often attends dropsy of the pericardium also: but cases are by no means rare in which effusions into these cavities, either alone or existing conjointly, are not attended with any œdematous tumefaction. Fluctuation is sometimes perceived in dropsy of the thorax, but I do not remember to have read that fluid in the pericardium ever discovered itself by this means, upon any concussion of the body.*

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* Dr. Hennen has related a case in which fluctuation was perceived. The symptoms were dyspnœa, pain in the right side, frequent and irregular pulse, anxious breathing, and only performed in the erect position. The heart palpitated, and the fluctuation of a fluid was perceptible at each stroke.

Dissection. The liver was enlarged, and the gall-bladder contained bile resembling tar. No fluid had been deposited in the cavity of the thorax, but the pericardium contained a pint and two ounces of serum. The heart was small and pale. The lung collapsed, and exhibited the sac of a large abscess.

Ed. Med. J. Oct. 1820.

Though instances of dropsy of the pericardium uncombined with hydrothorax are uncommon, they are not so exceedingly rare as some authors have supposed.—*Ed.*

A case is recorded by Brunnerus, in which the pericardium was turgid with water, and the right cavity of the thorax was filled with a similar fluid; and these effusions were complicated with ascites and enlargement of the liver. The patient complained of dyspnœa, and tightness about the præcordia; and he was almost unable to breathe in the night, except in the erect position. His feet were œdematous, and he had a cough which generally was unattended with expectoration. The abdomen and scrotum were tumid, and the whole body was somewhat swollen, but especially the right side, on which he generally lay. Where such complications exist, it is sometimes difficult to determine to which disease the symptoms refer.—46.

A sense of constriction in the region of the heart is not unfrequently associated with dropsy of the pericardium, but, like the other symptoms, it is equivocal.—47.

We must wait some time longer before we trephine the sternum, and perforate the pericardium—an operation remotely alluded to by Riolanus: for art has not yet sufficiently advanced to enable us so clearly to discover a redundance of serum in the pericardium, as to warrant such an enterprise.—48.

However, by combining the symptoms which arise, we shall attain to considerable probability in discriminating hydrops pericardii.

Senac, however, in his excellent treatise on diseases of the heart, has justly said, in relation to this dropsical affection, that it is not

only frequent but *difficilis cognitu, et difficilior sanatu.*—49.

In the Sepulchretum a case of sudden effusion into the cavities of the chest, and the removal of the fluid by paracentesis, is related. It occurred to a young man after excessive exercise on horseback. When the body was agitated, fluctuation was distinctly perceived on the left side of the chest, and the fluid was drawn through a canula, and continued to issue afterwards through an orifice kept open by artificial means.*—5.

Tozzius and Albertini have described cases in which they found serum in the lungs themselves. When effusion takes place into the texture of these viscera it constitutes what may properly be considered as dropsy of the lungs.†—33.

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* Paracentesis thoracis has often been performed successfully in cases of empyema, and sometimes in hydrothorax; but in instances of the latter description, though no doubt may exist as to the accumulation of fluid, there may be the greatest uncertainty as to the cavity it occupies. In the Transactions of the King's and Queen's College in Ireland, vol. 2, Dr. Archer has related a case in which this operation was performed, and eleven pints of fluid were drawn from the right cavity. The discharge ceased at the expiration of four months.

Morgagni did not bestow so much attention on the state of the urine in dropsy, as on other symptoms. Dr. Blackall is entitled to the merit of having particularly directed attention to the excretion of serum by the kidneys, which, in many dropsical cases, is so abundant that the urine is coagulable by heat. It is also probable, that the presence of serum in the urine is not confined to dropsical cases, though it may but seldom occur under other circumstances.—*Ed.*

† See a case of this description in note page 354.—*Ed.*

SECTION V.

Wounds of the Thorax.

Wounds of the diaphragm, and hernia through that septum.

A blind man, seventy years of age, fell and struck the left side of his chest against a flint, with such violence as to fracture his ribs, and was received into the hospital of St. Mary de Vita. His pulse was hard, he had an oppressive and pricking pain in the wounded part, respiration was very difficult: and although this difficulty subsided a little on the fourth day, it became more violent again on the sixth, and was accompanied with delirium. He died on the ninth day.

Dissection. The left cavity of the thorax was full of extravasated blood, and the true ribs of the corresponding side were all fractured. The seventh had wounded the diaphragm by its rugged extremity, and round the wound this muscle was universally inflamed.—*Valsalva*, liii. 5.

The blood was effused from the lacerated intercostal vessels. There is no mention of cough in this case, or of effusion into the abdomen. Probably the situation of the wound in the fleshy fasciculi, which might not have been completely perforated, will reconcile the apparent discrepancy between this case and that related before.* To the wounded and inflamed state of the diaphragm, which is the principal agent in respiration, the very urgent dyspnœa must be referred.—6.

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* Vide page 424.

Wounds of the diaphragm are not necessarily fatal. Many examples might be adduced of wounds in the muscular part having healed; and although it is more difficult to find examples of recovery from injuries inflicted on the tendinous portion, a case is recorded by the father-in-law of Sennertus, in which, after two months, the patient thought himself well for five months. It must, however, be acknowledged, that wounds of this septum are generally mortal.

The diaphragm is sometimes lacerated independent of any wounding instrument, and some of the abdominal viscera have been found in the thorax. This has happened in consequence of the natural openings being dilated or lacerated; in other cases the fibres have been torn asunder, and this accident is particularly liable to occur betwixt those fibres which proceed from the ensiform cartilage and the neighbouring fibres.

In some cases the diaphragm has been found perforated apparently from malformation, and the stomach has been found lying in one of the thoracic cavities, death taking place under circumstances which did not lead to any suspicion that this form of hernia existed. In the case of an old man, the stomach, omentum, part of the pancreas, and colon, were found lying in the left thoracic cavity; and the foramen, which was in the fleshy part of the diaphragm, was large, and circumscribed by a tendinous circle. On examining the body of a young man, the stomach was found in the right cavity, and the freedom from lungs indicated that this was an instance of malformation. He had not

been much oppressed with difficulty of breathing; but the most violent strainings to vomit, after taking antimony, were completely ineffectual. In another case, similar to this, vomiting was troublesome. In an infant two months old, which had been ill from birth, almost all the intestines and mesentery were found in the thorax, having passed through a preternatural foramen. Many other cases of this nature are on record. In a case, the result of laceration, the heart was displaced, and could be felt pulsating on the right side, the stomach having been urged into the left thoracic cavity. The patient lived several months; and patients have been known to survive this displacement of the abdominal viscera even for years. The diaphragm has likewise been perforated by a tumour of the pancreas pressing against it, and thus occasioning ulceration.*—liv. 11.

The diaphragm has not only been found to have more foramina in it than usual, but its tendinous centre has been ossified. A case of this description is related Ep. lxx. 5; in which case ossification had taken place to the extent of an inch and half.

Paralysis from a wound in the thorax.

A young man received a wound in the left part of his back, which passing downwards obliquely,

* To these cases of transposition of the viscera many others might be added. The most recent is one observed by Dr. Campbell, in an infant six weeks old. Part of the stomach, the small intestines, part of the colon, with the spleen, pancreas, and great omentum, were contained in the left thoracic cavity. The heart and right lung were pressed to the right side of the chest.—*Ed.*

Ed. Med. Surg. Journal, 1821.

and towards the right side, and grazing the vertebræ, entered the right cavity of the thorax betwixt the sixth and seventh rib. For some days the patient suffered slight difficulty of breathing, and pain in the anterior part of the body. On the fifth day cough and hæmoptysis occurred, accompanied with some numbness of the lower limbs. This numbness was succeeded by paralysis from the middle of the body downwards, and, at the same time, the abdomen became tumid and tense, accompanied with retention of urine and of fæces. He was occasionally seized with swoonings, and died in a fainting fit on the eighth day.

Dissection. Whilst moving the body a large quantity of blood issued from the side, and the right cavity of the thorax was found to contain a considerable quantity—probably from the laceration of the intercostal vessels: but the lung did not seem injured, though it was tumid and red. The pericardium was full of serum.

The numbness and paralysis may probably be ascribed to an injury of the intercostal nerve, and a consequent lesion of the great sympathetic.—liii. 18.

Injury of the thorax on one side, occasioning peripneumony and abscess on the other.

The following case of injury done to the thorax demonstrates that in wounded patients as well as in others, the symptoms must not always be imputed to the primary lesion.

A husbandman about thirty years of age, was wounded, with a cutting instrument, in the left scapula and to the second rib, so that the wound

inflicted was extensive. Whilst in the hospital he was seized with hæmoptysis, cough, and difficulty of respiration. The pulse was weak and frequent, and he was often affected with syncope, so that from these symptoms on the ninth day, he appeared to be near death. The urgency of the symptoms a little abated, and the wound assumed a more favourable aspect till the seventeenth day, when it suddenly swelled, violent fever came on, accompanied with a languid pulse, rigors, a sense of weight in the thorax, and laborious respiration. He died on the twenty-sixth day, and the body was dissected by Peter Molinelli.

Dissection. The right cavity of the thorax contained a large quantity of fluid not unlike whey; and the lung in this cavity was occupied by a large abscess, which communicated with the cavity of the chest. The left cavity, which corresponded with the wound, contained no fluid, and the lung was free from lesion. That part of the pleura, indeed, which was nearest to the wound, had a livid hue, but was not perforated, for the wound did not descend deeper than the second rib.

Morgagni, liii. 14.

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